2007 ILT NRC Exam Key
Question 1

Tier: 2 Group: 1
K/A: 203000 RHR/LPCI K2.02 2.5 RO
Knowledge of electrical power supplies to the following: Valves.
Reference: B.09.07
Reference provided during exam: None
Cognitive level: 3PEO Objective: M-8107L-023, 4
Source: New

Which of the following is the predicted impact on the LPCI system valves if a lock out condition would occur on 4160 Bus 15?

A. LPCI injection would be unaffected as the swing bus is normally powered from Load Center 103.

B. LPCI injection would be unaffected as the swing bus would be powered from Load Center 104 after a time delay.

C. LPCI Loop Select would NOT be able to isolate the 'A' Recirc loop as the Recirc discharge valve would NOT close.

D. LPCI injection would be limited to the 'B' loop as the normally closed RHR Cross-tie valve (MO-2033) would NOT have power to be opened.

Answer: B is correct as on a loss of voltage sustained for approximately 12 seconds, the swing bus automatically transfers to the Division 2 source.

Distractor A is incorrect as Load Center 103 would lose power due to the Bus 15 lockout.
Distractor C is incorrect as this valve is powered from the swing bus and would be energized after 12 seconds.
Distractor D is incorrect as the cross-tie MOV is normally open.

2007 ILT NRC Exam Key
Question 2

Tier: 2 Group: 1
K/A: 205000 Shutdown Cooling System K3.02 3.2 RO
Knowledge of the effect that a loss or malfunction of the shutdown cooling system will have on the following: Reactor water level.
Reference: B.03.04
Reference provided during exam: None
Cognitive level: 2RI Objective: M-8107L-023, 7
Source: 2005 ILT NRC Exam, Modified

The reactor was shutdown and 'A' loop of RHR was placed in Shutdown Cooling (SDC). CV-1994, 11 RHR PUMP MINIMUM FLOW VALVE, was inadvertently opened and cannot be closed.

What effect (if any) will this have on the SDC system?

A. No effect as the minimum flow line manual isolation block valve is closed per the SDC valve lineup.

B. ONLY SDC isolation valves (MO-2029 and MO-2030) will close at 9 inches RPV water level.

C. SDC isolation valves (MO-2029 and MO-2030) AND the LPCI inboard injection valve (MO-2014) will close at 9 inches RPV water level.

D. At 9 inches RPV water level the SDC isolation valves (MO-2029 and MO-2030) close AND the LPCI inboard injection valve (MO-2014) will open at –47 inches RPV water level.

Answer: C. is correct as MO-2029 and MO-2030 close. These valves close on a group 2 isolation (high drywell pressure or low RPV water level). The LPCI inboard injection valve will also receive a closed signal. Both isolations are seal in and require a reset of the group 2 isolation for the valves to be re-opened.

Distractor A is incorrect as there is no manual isolation valve.
Distractor B is incorrect as 2014 also receives an isolation signal.
Distractor D is incorrect as the isolation occurs at 9 inches and 2014 will only open if the group 2 isolation is reset.

2007 ILT NRC Exam Key
Question 3

Tier: 2 Group: 1
K/A: 206000 HPCI K4.19 3.7 RO
Knowledge of HPCI design feature(s) and/or interlocks which provide for the following: Automatic transfer of HPCI pump suction.
Reference: B.03.02
Reference provided during exam: None
Cognitive level: 1l Objective: M-8107L-002, 7
Source: New

A LOCA is in progress. Under what conditions do you anticipate MO-2061 and MO-2062, HPCI TORUS SUCT INBOARD and OUTBOARD ISOLATION VALVES, respectively, will receive an OPEN signal?

A. ONLY when CST water level reaches 2' 8".

B. ONLY when Suppression Pool level rises to 2" above normal.

C. When CST water level reaches 2' 8" **OR** Suppression Pool level rises to 2" above normal.

D. When CST water level reaches 2' 8" **OR** Suppression Pool level rises to 2" above normal, **AND** MO-2063, HPCI CST SUCT VALVE, is fully closed.

Answer: C is correct as if the CST reaches 2' 8" OR the torus level is 2" above normal, the following occurs:

- MO-2063, HPCI CST Suct, receives a close signal
- MO-2061 and MO-2062, HPCI TORUS SUCT INBOARD and OUTBOARD ISOLATION VALVES, respectively, receive and OPEN signal
- CV-3503, HPCI Test Return Flow, and MO-2071, HPCI Test Return Isolation, receive close signal upon opening of MO-2061 and MO-2062.

Distractors A, B, and D are plausible variations of this interlock.

2007 ILT NRC Exam Key
Question 4

Tier: 2 Group: 1
K/A: 209001 LPCS K5.01 2.6 RO
Knowledge of the operational implications of the following concepts as they apply to Low Pressure Core Spray System: Indications of pump cavitation.
Reference: C.4-B.04.01
Reference provided during exam: None
Cognitive level: 2RI Objective: M-8114L-002, 1
Source: New

A LOCA is in progress. Both Core Spray pumps are injecting at 3000 gpm each to maintain RPV water level above the top of active fuel. Which of the below listed plant parameters may be an indication of pump cavitation in the Core Spray pump(s)?

A. Steadily lowering of Core Spray pump amps

B. Steadily lowering of Core Spray discharge pressure

C. Annunciator 3-A-29 (CORE SPRAY 1 PRESS VLV LEAKING) in alarm

D. Repeated alarming and subsequent clearing of annunciator 3-A-41(AC INTERLOCK)

Answer: D is correct as cavitation can be directly related to pump NPSH. During a LOCA ECCS operation results in deposition of debris on the ECCS suction strainers. Indications include erratic and dramatic fluctuations in pump discharge pressure. One alarm that may clue the operator to this condition is the alarming and subsequent clearing of the AC INTERLOCK (3-A-41).

Distractors A and B are incorrect as these parameters would fluctuate.
Distractor C is plausible, but incorrect as although this annunciator deals with C.S. pressures, it would not be an indication of cavitation.

2007 ILT NRC Exam Key
Question 5

Tier: 2 Group: 1
K/A: 211000 SBLC K6.03 3.2 RO
Knowledge of the effect that a loss or malfunction of the following will have on the SBLC system: A.C. power.
Reference: ITS section 3.1.7, ARP C.6-005-B-15
Reference provided during exam: ITS section 3.1.7, ARP C.6-005-B-15
Cognitive level: 3SPR Objective: M-8107L-004, 8
Source: New

The reactor is operating at rated conditions. The following conditions exist:

- Annunciator 5-B-15 (STANDBY LIQUID HI/LO TEMP) alarms
- The out plant operator reports that Bkr B3230, T-200 STBY LIQUID CONTROL TK HEATER, has tripped open and cannot be re-closed
- Area Temperature is determined to be 67°F and lowering at 1°F per hour
- Chemistry reports SBLC boron concentration to be 13.5 wt%

Based on the above information, what effect will this have on the SBLC system?

A. SBLC must be declared inoperable per ITS.

B. No action is required.

C. Demineralized water must be added to the SBLC test tank to dilute the boron concentration to prevent crystallization.

D. Action must be taken to ensure SBLC piping and tank temperature will remain above ITS limits by installing temporary heaters.

Answer: D is correct as the low temperature annunciator alarms at 68°F, indications are present that the A.C. power supply has malfunctioned, area temperature/boron concentration per figure 3.1.7-2 indicate that currently it is currently within 5°F, thus taking action to ensure SBLC piping and tank temperature will remain above ITS limits by installing temporary heaters is the correct response to prevent the possibility of crystallization in the piping.

Distractors A and B are incorrect as the temperature does not support these actions.
Distractor C is incorrect as while this may help prevent crystallization, solution concentration may fall outside the ITS limit and this action is not called out by the ARP.

2007 ILT NRC Exam Key
Question 6

Tier: 2 Group: 1
K/A: 211000 SBLC K4.07 3.8 RO
Knowledge of SBLC system design feature(s) and/or interlocks which provide for the following: RWCU isolation.
Reference: B.03.05
Reference provided during exam: None
Cognitive level: 1l Objective: M-8107L-004, 5
Source: New

During an ATWS condition, the OATC positioned the SLC System Selector Switch on panel C05 to SYS 1. What are the expected affects on the RWCU system isolation valves from this action?

A. MO-2397 and MO-2398, RWCU INLET INBOARD and INLET OUTBOARD ISOL, valves receive a close signal. MO-2399, RWCU RETURN ISOL, valve remains as is.

B. MO-2397, RWCU INLET INBOARD ISOL, and MO-2399, RWCU RETURN ISOL, valves receive a close signal. MO-2398, RWCU INLET OUTBOARD ISOL, remains as is.

C. MO-2398, RWCU INLET OUTBOARD ISOL, and MO-2399, RWCU RETURN ISOL, valves receive a close signal. MO-2397, RWCU INLET INBOARD ISOL, remains as is.

D. MO-2397 and MO-2398, RWCU INLET INBOARD and INLET OUTBOARD ISOL, and MO-2399, RWCU RETURN ISOL, valves receive a close signal.

Answer D is correct as when the keylocked switch in the Control Room actuates one of the two SBLC pumps, RWCU valves MO-2397, MO-2398, and MO-2399 close automatically.

Distractors A, B, and C are plausible incorrect responses to this situation.

2007 ILT NRC Exam Key
Question 7

Tier: 2 Group: 1
K/A: 212000 RPS A1.09 2.7 RO
Ability to predict and/or monitor changes in parameters associated with operating the RPS controls including: Individual relay status.
Reference: NX-7834-67-9 (10) (11)
Reference provided during exam: NX-7834-67-9 (10) (11)
Cognitive level: 3SPR Objective: M-8107L-072, 6
Source: New

A Reactor Scram has occurred due to low RPV water level. The actions of C.4-A (REACTOR SCRAM) have been completed up to the point of resetting the scram. RPV water level has been stabilized above the scram setpoint and the CRS has directed that the scram be reset.

If relay 5A-K18B has failed in the energized condition what will be the end result of the MANUAL SCRAM PUSHBUTTON red back lighting after the actions to reset the scram have been taken?

	MANUAL SCRAM PUSHBUTTON A	MANUAL SCRAM PUSHBUTTON B
A.	LIT	LIT
B.	LIT	NOT LIT
C.	NOT LIT	LIT
D.	NOT LIT	NOT LIT

Answer: C is correct as this relay is a TDDO relay and as such must de-energize after the 2 second time delay to allow the relays 5A-K17B and 5A-K18B to close. These two contacts bypass the mode switch in shutdown scram signal allowing relays 5A-K14B and 5A-K14D to energize. This closes their associated contacts and also turns the manual scram red lights off. If 5A-K18B failed in the energized position, its associated light would remain lit.

Distractors A, B, and D are each plausible misinterpretations of the logic.

2007 ILT NRC Exam Key
Question 8

Tier: 2 Group: 1
K/A: 212000 RPS K5.02 3.3 RO
Knowledge of the operational implications of the following concepts as they apply to RPS: Specific logic arrangements.
Reference: B.05.06, NX-7834-67-9 (10) (11) (13)
Reference provided during exam: NX-7834-67-9 (10) (11) (13)
Cognitive level: 3SPR Objective: M-8107L, 6
Source: New

The reactor was operating at rated conditions when the following actions occur:

- A manual scram is inserted
- 2 minutes later all scram signals are clear except the SDV HI HI level
- The CRS directs the scram to be reset
- The OATC bypasses the SDV high level scram signal

What position(s) of the Mode Switch will allow the scram to be reset?

A. SHUTDOWN ONLY

B. SHUTDOWN **OR** REFUEL ONLY

C. SHUTDOWN **OR** REFUEL **OR** START TO HOT STBY ONLY

D. SHUTDOWN **OR** REFUEL **OR** START TO HOT STBY **OR** RUN

Answer: B is correct as the scram signal can only be reset if all scram signals are clear. This can only be accomplished if the mode switch is in either shutdown or refuel and the SDV scram signal is bypassed for this RPS logic arrangement.

Distractors A, C, and D are plausible but incorrect interpretations of this RPS logic arrangement.

2007 ILT NRC Exam Key
Question 9

Tier: 2 Group: 1
K/A: 215003 IRM A2.04 3.7 RO
Ability to (a) predict the impacts of the following on the IRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Upscale or downscale trips.
Reference: C.6-005-A-21, C.6-005-B-4
Reference provided during exam: Attached Pictures
Cognitive level: 3 SPR Objective: M-8107L-064, 6
Source: New

A reactor startup is in progress with the following conditions present:

- The reactor is critical but below the Point of Adding Heat
- Period is approximately 85 seconds
- Annunciator 5-A-21 (IRM A HI HI/INOP) is in alarm

Using the following images, assess the condition of the IRMs, and based on that assessment, describe the procedural action to correct this condition.

A. 11 IRM has an INOP trip, bypass 11 IRM and reset the half scram.

B. 11 IRM has an INOP trip, place 11 IRM channel function selector switch to STBY.

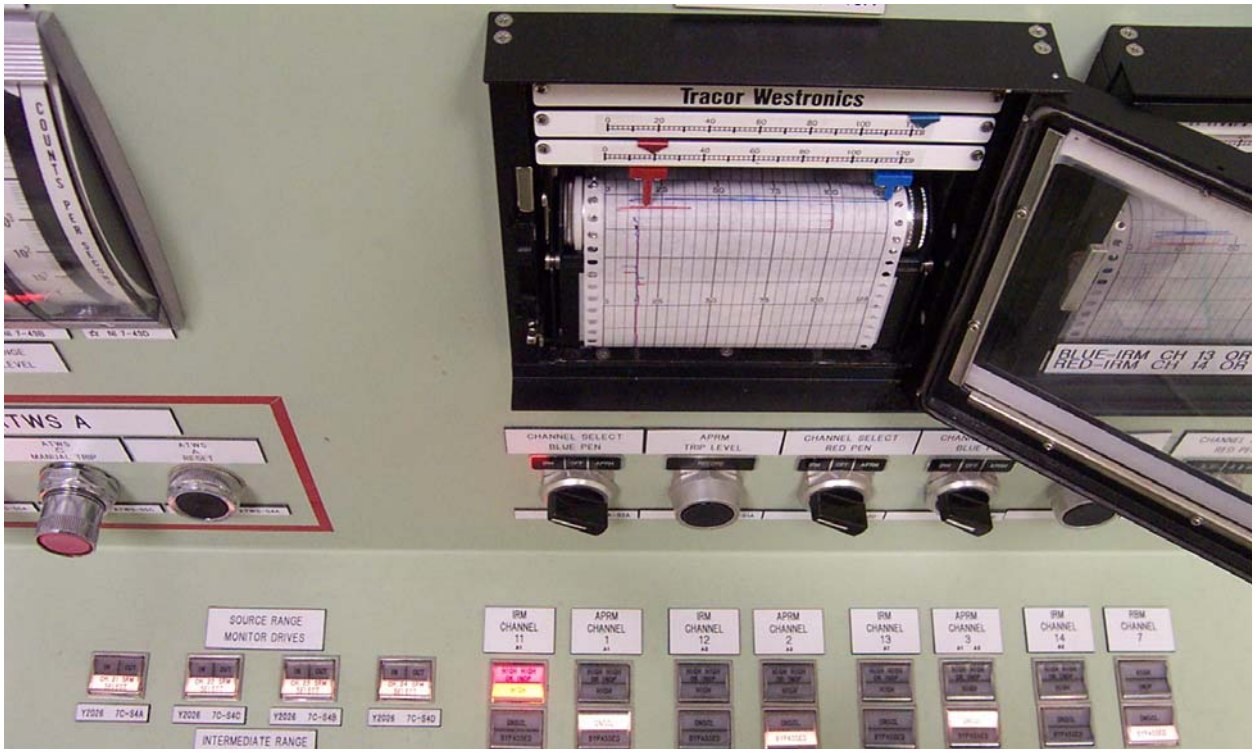
C. 11 IRM has exceeded the HI HI setpoint, range up IRM 11 and reset the half scram.

D. 11 IRM has exceeded the HI HI setpoint, range up IRM 11 to clear the rod block, the scram function is bypassed at this plant condition.

Answer: C is correct as with the Mode switch in Startup, IRM 11 would initiate a scram signal on RPS channel A due to it being upscale as indicated by the C05 and back panel indications.

Distractor A is incorrect as the IRM is NOT inop as determined by the back panel indication light NOT being lit.
Distractor D is incorrect as the IRM RPS trip is NOT bypassed in this plant condition.
Distractor B is incorrect as the IRM is NOT INOP and this action would result in a trip signal.

2007 ILT NRC Exam Key
Question 9 Pictures



IRM Channel #11

2007 ILT NRC Exam Key
Question 10

Tier: 2 Group: 1
K/A: 215004 SRM A3.03 3.6 RO
Ability to monitor automatic operations of the SRM system including: RPS status.
Reference: B.05.01
Reference provided during exam: None
Cognitive level: 1l Objective: M-8107L-054, 6
Source: New

A reactor startup is in progress with the following conditions present:

- All SRMs are fully inserted
- Shorting Links are installed
- Channel 21 SRM reads 2 x 10^5 cps
- Channel 22 SRM reads 4 x 10^5 cps
- Channel 23 SRM reads 6 x 10^5 cps
- Channel 24 SRM reads 3 x 10^5 cps

Based on the above information, the Reactor Protection System will be in which of the following states?

A. No RPS trip

B. RPS bus "A" trip

C. RPS bus "B" trip

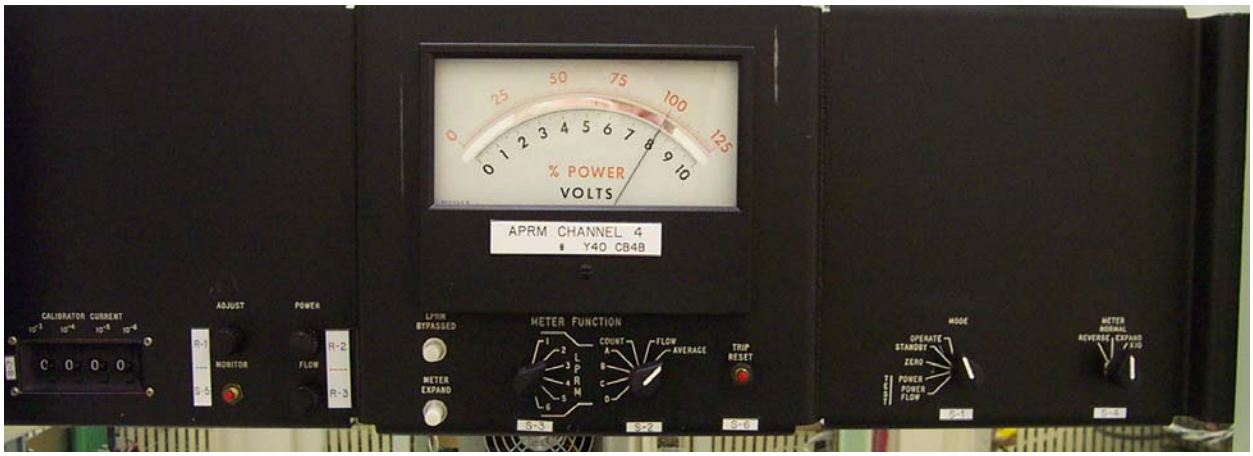
D. RPS buses "A" AND "B" trip

Answer: A is correct as the shorting links are installed which bypass the SRM HI flux scram.

Distractor B is incorrect as the candidate may assume that the shorting links are still installed due to the outage and have not been removed for the startup. This condition is backwards and would result in an odd numbered SRM channel trip on the A RPS bus.
Distractor C is incorrect as the candidate may assume that the shorting links are still installed due to the outage and have not been removed for the startup. This condition is backwards and would result in an even numbered SRM channel trip on the B RPS bus.
Distractor D is incorrect as the candidate may assume that the shorting links are still installed due to the outage and have not been removed for the startup. This condition is backwards and would result in an non-coincident RPS trip.

2007 ILT NRC Exam Key
Question 11

Tier: 2 Group: 1
K/A: 215005 APRM/LPRM A4.03 3.2 RO
Ability to manually operate and/or monitor in the control room: APRM back panel switches, meters and indicating lights.
Reference: B.05.01
Reference provided during exam: None
Lesson: M8107L-066 Objective: 7
Cognitive level: 3SPR
Source: 2006 LOR Biennial Exam



S-2

From the above picture with the reactor operating at rated conditions, if switch S-2 on the APRM is taken to COUNT the result will be…

A. initiation of a RMCS control rod block only.

B. initiation of a RPS half scram AND RMCS control rod block.

C. meter indicating total number of LPRMs assigned to the APRM.

D. meter indicating total number of non-bypassed LPRMs assigned to the APRM.

Answer: D is correct as the count circuit monitors the number of LPRM channels operating in each APRM channel.

Distractor A and B are incorrect as although an INOP condition is generated by the count circuit if there are not enough operating LPRMs for each APRM, taking this switch to count does not result in a RPS or RMCS actuation.
Distractor C is incorrect as the count circuit does not count bypassed LPRMs.

2007 ILT NRC Exam Key
Question 12

Tier: 2 Group: 1
K/A: 215005 APRM/LPRM A2.07 3.2 RO
Ability to (a) predict the impacts of the following on the APRM/LPRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Recirculation flow channels flow mismatch.
Reference: B.05.01.02, C.6-005-A-38
Reference provided during exam: None
Cognitive level: 3 PEO Objective: M-8107L-069, 7
Source: New

With the reactor operating at rated conditions, predict the impact (if any) of a 10% deviation between the output signals of Flow Converter 1 and Flow Converter 2 AND what action(s) are required to be taken by procedure to confirm this condition.

A. No impact as the setpoint for Comparator deviation is set at 12% and thus neither RMCS nor RPS initiations are expected.

B. A control rod withdraw block will be initiated due to a Comparator INOP signal, this is confirmed by observing the Comparator INOP **AND** the UPSCL/INOP indicating lights lit on Panel C-37.

C. A control rod insert **AND** withdraw block will be initiated due to a Comparator INOP signal, this is confirmed by observing the Comparator INOP **AND** the UPSCL/INOP indicating lights lit on Panel C-37.

D. A control rod withdraw block **AND** a half scram will be initiated due to a Comparator INOP signal, this is confirmed by observing the Comparator INOP **AND** the associated APRM channel UPSCL/INOP indicating lights lit on Panel C-37.

Answer: B is correct as a Comparator inop condition exists when the deviation between output signals of Flow Converter 1 and Flow Converter 2 exceed 8%. Confirmatory indications per the ARP are to observe the Comparator INOP **AND** the UPSCL/INOP indicating lights lit on Panel C-37 and verify the automatic action of RMCS rod withdraw block.

Distractor A is incorrect as the setpoint is 8%.
Distractor C is incorrect as no insert block will be initiated.
Distractor D is incorrect as no RPS signal is initiated.

2007 ILT NRC Exam Key
Question 13

Tier: 2 Group: 1
K/A: 217000 RCIC 2.1.24 2.8 RO
Ability to analyze the affect of maintenance activities on LCO status.
Reference: ITS Section 3.5.3
Reference provided during exam: ITS Section 3.5.3 (RCIC)
Cognitive level: 3SPR Objective: M-8107L-003, 11
Source: New

A reactor startup after a refueling outage is in progress with the following conditions present:

- RPV pressure exceeded 150 psig at 0100
- RPV pressure is 160 psig and steady
- Test 0255-08-III-1 (RCIC COMPREHENSIVE PUMP AND VALVE TEST) was being performed to satisfy the 24 month requirement, but is on hold due to repairs on the Trip Throttle Valve linkage
- RCIC was declared inoperable at 0300
- HPCI operability has been satisfactorily demonstrated
- Estimated time for repair completion is at 0800 of the same day

What effect does this have on the reactor startup?

A. The startup may continue without restriction, as long as the test is completed within 12 hours of declaring RCIC inoperable.

B. The reactor must be in MODE 3 within 12 hours and <150 psig within 36 hours of the time and date that reactor pressure exceeded 150 psig.

C. SR 3.5.3.3 must be completed within 14 days from the time and date RCIC was declared inoperable. The Reactor Mode Switch cannot be transferred to RUN.

D. With a satisfactorily completed risk assessment, the startup may continue and the Reactor Mode Switch may be placed in RUN.

Answer: C is correct as when RCIC maintenance was required, it became inoperable. Since the applicability requires operability in MODE 2 when above 150 psig, Condition A and Required Actions A.1 and A.2 must be entered.

Distractor A is incorrect as the LCO applicability is no longer met.
Distractor B is incorrect as the startup may continue as long as required Actions A.1 and A.2 are satisfied.
Distractor D is incorrect as this action is specifically not allowed for this LCO.

2007 ILT NRC Exam Key
Question 14

Tier: 2 Group: 1
K/A: 218000 ADS K1.02 4.0 RO
Knowledge of the physical connections and/or cause-effect relationships between ADS and the following: Low pressure core spray.
Reference: B.03.03, C.6-003-A-41
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L-005, 5
Source: New

Which of the following describes the relationship between the Core Spray System and ADS?

A. One Core Spray pump with the associated 4160 KV power supply breaker closed will satisfy the ADS logic blowdown permissive.

B. Both Core Spray pumps must have their associated 4160 KV power supply breaker closed to satisfy the ADS logic blowdown permissive.

C. One Core Spray pump with a discharge pressure of ≥100 psig will satisfy the ADS logic blowdown permissive.

D. Both Core Spray pumps must have a discharge pressure of ≥100 psig to satisfy the ADS logic blowdown permissive.

Answer: C is correct as for ADS to automatically initiate at least one RHR or Core Spray pump running with a nominal discharge pressure of 100 psig must be present along with RPV low low water level of -47 inches.

Distractor A is incorrect as the pump must generate at least 100 psig discharge pressure.
Distractor B is incorrect as only one pump is needed to satisfy the logic and the pump must generate at least 100 psig discharge pressure.
Distractor D is incorrect as only one pump is needed to satisfy the logic.

2007 ILT NRC Exam Key
Question 15

Tier: 2 Group: 1
K/A: 223002 PCIS K1.11 2.9 RO
Knowledge of the physical connections and/or cause-effect relationships between PCIS and the following: Containment atmosphere sampling.
Reference: B.05.06, C.4-B.04.01.B
Reference provided during exam: None
Cognitive level: 2DR Objective: M-8107L-070, 5
Source: LXR Bank

Given the following plant conditions:

- The plant is in MODE 4
- "A" loop of RHR is in Shutdown Cooling
- TIP probes are being inserted into the reactor for Post Maintenance Testing
- Rad Monitor RM-17-452A, REACTOR BUILDING VENTILATION EXHAUST PLENUM MONITOR CHANNEL A, experiences a loss of power
- Annunciator 5-A-1 (REAC BLDG VENT & FP RAD CH A-HI/LO) is in alarm

Which of the following are isolated as a result of this equipment malfunction?

1. Drywell CAM sample valves
2. TIP system
3. "A" Loop of RHR
4. Both "A" and "B" H_2O_2 analyzers

A. 1 and 2

B. 1 and 4

C. 2 and 3

D. 3 and 4

Answer: B is correct as containment isolation valves for the D/W CAM and both trains of H2O2 close due to these radiation monitor failures. This is commonly referred to as a "partial group 2 isolation" at MNGP. A "full group 2" is identified by RPV water level of 9 inches OR 2 psig D/W press. Partial group 2 and Full group 2 isolations and their initiation signals offer potential confusion.

Distractors A, C, and D represent various combinations for misinterpretation.

2007 ILT NRC Exam Key
Question 16

Tier: 2 Group: 1
K/A: 239002 SRVs K3.03 4.3 RO
Knowledge of the effect that a loss or malfunction of Relief/Safety valves will have on the following: Ability to rapidly depressurize the reactor.
Reference: B.03.03
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L-025, 8
Source: New

With the reactor operating at rated conditions, annunciator 3-A-17 (AUTO BLOWDOWN VLV BELLOWS LEAKING) alarms. The white light is lit for SRV RV-2-71-C.

Which of the following describes the ability of that SRV to rapidly depressurize the reactor if plant conditions require?

RV-2-71-C …

A. will **NOT** be capable of operating for initiation of ADS.

B. will operate in its safety function at a lower reactor pressure.

C. will operate automatically if an ADS signal is generated.

D. **CANNOT** be opened manually from C-03 for a blowdown.

Answer: C is correct as if the bellow is leaking, steam pressure builds up in the pilot stage bonnet. The bellows leaking pressure switches sense the pressure inside the bonnet and are actuated when the pressure builds up to 5 psig. If the sensing bellows should fail, only the safety function (self actuation) of the valve is disabled (i.e. the self actuation setpoint of the SRV will drift up by an amount equal to the bellows line pressure.) The valve can still be operated manually or by the ADS or LLS system circuitry.

Distractors A, B, and D are plausible misunderstandings of this malfunction.

2007 ILT NRC Exam Key
Question 17

Tier: 2 Group: 1
K/A: 259002 RPV Level Control K4.10 3.4 RO
Knowledge of the Reactor Water Level Control System design feature(s) and/or interlocks which provide for the following: Three element control (main steam flow, reactor feedwater flow, and reactor water level provide input).
Reference: B.05.07
Reference provided during exam: None
Cognitive level: 1P Objective: M-8113L-001LP, 2
Source: New

During a Reactor startup, when do plant conditions support the design limitations of the Reactor Water Level Control System allowing it to be placed in 3 Element Control?

A. When the first Feedwater Control Valve is placed in automatic.

B. When the Master Feedwater Level Controller is placed in automatic.

C. When the second Feedwater Control Valve is placed in automatic.

D. When feedwater flow is sufficient to clear Reactor Recirc pump low flow interlock.

Answer: C is correct as when the second FRV is placed in service, the FWLC system is placed in 3 element control this manual action is performed at ~40% reactor power.

Distractor A is incorrect as this action is performed at approximately 20%.
Distractor B is incorrect as this action is performed when the first FRV is placed in service.
Distractor D is incorrect as this action is achieved at 1.4Mlbm/hr which is approximately 20% reactor power.

2007 ILT NRC Exam Key
Question 18

Tier: 2 Group: 1
K/A: 261000 Standby Gas Treatment System A4.07 3.1RO
Ability to manually operate and/or monitor in the control room: System flow.
Reference: M8107L-008, B.04.02
Reference provided during exam: Picture of SBGT controller FIC 2943
Cognitive level: 3SPR, PEO Objective: M-8107L-008, 7
Source: 2005 ILT NRC Exam

With the reactor operating normally at rated conditions, HS-2988A, SBGT UNIT A 1 / 2 (Manual/Auto), is in AUTOMATIC.

Based on the following picture of FIC 2943, SBGT A LOOP FLOW INDICATING CONTROLLER, if a PCIS Partial Group 2 isolation occurred, the "A" SBGT System would…

A. start, and achieve the required flow rate.

B. start, but **NOT** achieve the required flow rate.

C. **NOT** start, and **NOT** achieve the required flow rate.

D. **NOT** start, the "B" SBGT System would start due to low flow after a 10 second delay.

Answer: A. is correct as when an initiation signal is received, PCIS group 2 initiated SBGT and isolates Secondary Containment, and the controllers are normally placed in Manual.

Distractor B is incorrect as the controller is aligned in the normal configuration for auto initiation.
Distractors C and D are incorrect as the flow controller does not control the fan start signal, only the flow.

2007 ILT NRC Exam Key
Question 18 Picture

2007 ILT NRC Exam Key
Question 19

Tier: 2 Group: 1
K/A: 261000 Standby Gas Treatment System A1.07 2.8 RO
Ability to predict and/or monitor changes in parameters associated with operating the SBGT system controls including: SBGT train temperature.
Reference: B.04.02
Reference provided during exam: None
Cognitive level: 3PEO Objective: M-8107L-008, 8
Source: New

An automatic SBGT initiation occurred due to a group 2 isolation. What changes in train temperature are predicted if the Filter Heater Control Switch, E-34A-1, was in the OFF position?

SBGT train A temperature will…

A. rise when filter flow exceeds 2000 scfm until filter temperature reaches 200°F.

B. rise when filter flow exceeds 2000 scfm. The heater will not shutdown when train temperature reaches 200°F.

C. essentially remain at inlet flow temperature because the heater will not start with the control switch in OFF.

D. rise only if SBGT train A AUTO/STANDBY mode switch, HS-2988A, is taken to manual to energize the heater.

Answer: A is correct as with HS-2988A in the normal standby condition (AUTO) the filter heater operates the same whether its control switch (E-34A-1) is in ON or OFF. With an auto initiation signal present, the heater will energize when filter temperature is 200°F and filter flow is 2000 sfcm.

Distractors B, C, and D are plausible, but incorrect interpretations of how the SBGT switch logic is arranged.

2007 ILT NRC Exam Key
Question 20

Tier: 2 Group: 1
[Question Key was changed to accept <u>both</u> distractors A and D as correct answers. The original correct answer was distractor D. Based on a clarification provided during the exam, distractor A was also determined to be a correct answer. The clarification provided to the question stem during the exam is shown in Bold, Underlined , and Italics (i.e., the words "Control Room" were added to the question stem).]

K/A: 262001 A.C. Distribution K6.01 3.1RO
Knowledge of the effect that a loss or malfunction of the following will have on the A.C. Distribution: D.C. power.
Reference: B.09.06
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L-039, 5
Source: New

What would be the effect on 4.16 KV breaker operation if all D.C. control power is lost?

Breaker operation with the ***<u>Control Room</u>*** control switch would be lost to…

A. all 4.16 KV breakers.

B. all 4.16 KV breakers EXCEPT for buses 13 and/or 14.

C. all 4.16 KV breakers EXCEPT for buses 15 and/or 16.

D. all 4.16 KV breakers EXCEPT for buses 17 and/or 18.

<u>Answer:</u> ***<u>A and</u>*** <u>D</u> ~~is~~ ***are*** correct as to control opening and closing plant breakers in the 4.16 KV system, DC power is used from 125 Volt station batteries. Control power for discharge structure Busses 17 and 18 is alternating current supplied from one of two control power transformers, one operating off each bus.

~~Distractor A is incorrect as the exception is buses 17 and 18.~~
Distractor B is incorrect as these buses use DC control power.
Distractor C is incorrect as although the use of alternate sources for control power may be used, it takes approval by the plant manager, and therefore the initial result would be a loss of remote breaker operation.

2007 ILT NRC Exam Key
Question 21

Tier: 2 Group: 1
K/A: 262002 Uninterruptable Power Supply A2.01 2.6 RO
Ability to predict the impacts of the following on the Uninterruptable Power Supply System and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Under Voltage.
Reference: M8107L-063 Obj. 9, B.09.13, C.4-B. 09.13
Reference provided during exam: None
Cognitive level: 3PEO
Source: New

The reactor is operating at rated conditions when the following occur:

- Annunciator 8-A-24 (DIV 1 INVERTER Y-71 TROUBLE) alarms
- Annunciator 8-A-4 (Y-10/Y-70 INSTR AC LOSS OF VOLTAGE) alarms

Which of the following predicts the impact of the above indications on plant operation **AND** what action is required to mitigate this impact?

A. RCIC is no longer available as an injection source; Y-71 must be manually transferred to MCC-134.

B. HPCI is no longer available as an injection source; Y-71 must be manually transferred to D-31.

C. Control rod insertion is no longer available; Y-71 must be manually transferred to D-100.

D. Recirc scoop tubes are both locked; Y-71 must be manually transferred to MCC-133A.

Answer: A is correct as the indications given are associated with a loss of power from the Y-71 inverter. The Static Transfer Switch did not automatically transfer power to the alternate source as designed, and thus must be manually transferred to restore power to its loads.

Distractors B, C, and D are plausible, but incorrect variations on the design of the Inverter transfer switch operation.

2007 ILT NRC Exam Key
Question 22

Tier: 2 Group: 1
K/A: 263000 DC Electrical Distribution A2.01 2.8 RO
Ability to (a) predict the impacts of the following on the DC Electrical Distribution; and (b) based on those predictions, used procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Grounds.
Reference: ARP 8-A-25, 4512-CM
Task: CR200.193 Lesson: M-8107L-041 Objective: 5
Reference provided during exam: 4512-CM
Cognitive level: 3SPR
Source: 2006 LOR Biennial Exam

The reactor was operating at rated conditions when annunciator 8-A-25 (250V DC BUS GROUND) alarmed. The CRS assigned procedure 4512-CM (TROUBLE SHOOTING FOR 250 VDC BATTERY SYSTEM GROUNDS – BATTERY NO. 13) to the BOP to perform.

Given the following readings:

- P-21 75 volts
- P-12 67 volts
- N-12 30 volts

Based on the above indications, the BOP would …

A. RESET the alarm by depressing the RESET button.

B. RESET the alarm by resetting the lockout relay 86 and then depress the RESET button.

C. RESET the alarm by depressing the RESET button and then RESET the lockout relay 86.

D. Wait for an Electrician to inspect the battery and then RESET the alarm by resetting the lockout relay 86 and depressing the RESET button.

Answer: B is correct as the negative side is determined to exceed the ground current leakage limit and the next action is to perform these actions.

Distractors A, C, and D are reasonable actions but are not prescribed by the procedure at this point or depend on an incorrect assessment of where the ground is located.

2007 ILT NRC Exam Key
Question 23

Tier: 2 Group: 1
K/A: 263000 DC Electrical Distribution A3.01 3.2 RO
Ability to monitor automatic operations of the D.C. Electrical Distribution System including: Meters, dials, recorders, alarms, and indicating lights.
Reference: B.05.13, C.4-B.5.13.A
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L-041, 7
Source: New

Which of the following describes an indication that a loss of the 125 Vdc Bus A has occurred?

A. The white indicator lights below annunciator panels for C-03, C-04, C-05, C20, and C-259 are OFF.

B. The white indicator lights below annunciator panels for C-06, C-07, and C-08 are OFF.

C. The white indicator lights below annunciator panels for C-03, C-04, C-05, C-06, C-07, C-08, C20, and C-259 are OFF.

D. The white indicator lights below annunciator panels for C-03, C-04, C-05, C-06, C-07, C-08, C20, and C-259 are LIT.

Answer: B is correct as these annunciator panels are powered from 125 Vdc bus A and the power available light will be OFF if there is a loss of this power.

Distractors A, C, and D are incorrect and plausible alternatives to this question.

2007 ILT NRC Exam Key
Question 24

Tier: 2 Group: 1
K/A: 264000 Emergency Diesel Generators A3.04 3.1 RO
Ability to monitor automatic operations of the EDG including: Operation of the governor control system on frequency and voltage control.
Reference: B.09.08
Reference provided during exam: None
Cognitive level: 1I Objective: M-8107L-042, 2
Source: New

During normal plant operation with the EDGs in standby mode, the governor speed droop setting is dialed to ___(1)___ which allows EDG speed to___(2)___ as load rises during an auto start event.

	(1)	(2)
A.	zero	lower
B.	zero	be constant
C.	the scribe mark	be constant
D.	the scribe mark	lower

Answer: B is correct as when the EDG is in a standby mode, Speed Drop must be dialed to zero in order to maintain frequency stability throughout the EDG load. With speed drop set at zero, the EDG speed will stay constant as load varies.

Distractors A, C, and D are plausible, but incorrect settings and results pertaining to speed droop setting and the effect that would be able to be monitored from the control room.

2007 ILT NRC Exam Key
Question 25

Tier: 2 Group: 1
K/A: 300000 Instrument Air A4.01 2.6 RO
Ability to manually operate and/or monitor in the control room: Pressure gauges.
Reference: C.6-0006-B-24, C.4-B.08.04.01.A
Reference provided during exam: None
Cognitive level: 1F Objective: M-8114-002LP, 1
Source: New

With the reactor operating at rated conditions a leak in the instrument air system results in the following:

- Annunciator 6-B-34 (INSTRUMENT AIR DRYER BYPASSED) alarmed
- CV-1473, INST AIR DRYER BYP CV, opens

Based only on the above, what is the HIGHEST pressure reading on PI-1476, INST AIR HEADER PRESS IND, located on control room Panel C06 that the BOP operator would expect to observe simultaneously with these indications?

A. 90 psig

B. 87 psig

C. 85 psig

D. 82 psig

Answer: B is correct as alarm 6-B-24 (INSTRUMENT AIR DRYER BYPASSED) and CV-1473 open when instrument air header lowers to 87 psig.

Distractor A is incorrect as this is the pressure that the non-essential instrument air isolation valves automatically reset and re-open upon restoration of air pressure
Distractor C is incorrect as this is the pressure that alarm 6-B-35 (SERVICE AIR HEADER LOW PRESSURE) alarms and the service air isolation valve closes.
Distractor D is incorrect as this is when non-essential instrument air isolations close.

2007 ILT NRC Exam Key
Question 26

Tier: 2 Group: 1
K/A: 400000 CCW 2.1.28 3.2 RO
Knowledge of the purpose and function of major system components and controls.
Reference: B.02.05
Reference provided during exam: None
Cognitive level: 3SPR Objective: M-8107L-026, 7
Source: New

Based on the above picture, which RBCCW pump, if any, would auto start under the following conditions?

A. Neither pump would auto start under any condition.

B. The 11 pump would auto start if normal power was lost and the associated EDG automatically loaded to the bus.

C. The 12 pump would auto start if system discharge pressure lowered to 30 psig.

D. The 12 pump would auto start if normal power was lost and the associated EDG automatically loaded to the bus.

Answer A is correct as the purpose of the STANDBY / SETUP button on Panel C06 is to provide a means of placing the non-running RBCCW pump in a standby start condition. This is performed and confirmed by depressing the pushbutton and verifying the white light is lit to confirm the interlock. Without this indication, the standby start condition is not available.

Distractor B is incorrect as the running pump cannot be placed in the standby condition.
Distractor C is incorrect as the auto start would only occur on low system discharge pressure and if the white light were lit.
Distractor D is incorrect as there is no auto start feature based on bus loss and subsequent recovery due to having under voltage relaying.

2007 ILT NRC Exam Key
Question 27

Tier: 2 Group: 2
K/A: 201002 RMCS K3.01 3.4 RO
Knowledge of the effect that a loss or malfunction of the RMCS will have on the following: Ability to move control rods.
Reference: B.05.05
Reference provided during exam: None
Cognitive level: 3SPK Objective: M-8107L-032, 7
Source: 2006 LOR Biennial Exam

Control rod 14-27 is selected and being withdrawn using single notch withdraw from notch 14 to notch 16. During rod movement, the ROD SELECT POWER switch was inadvertently taken to the OFF position. What effect will this have on control rod 14-27?

Control rod 14-27 will…

A. withdraw 1 notch and settle at position 16 and then become de-selected.

B. become de-selected, drift to position 14, and RMCS will initiate a ROD DRIFT alarm.

C. become de-selected, drift to either position 14 or 16, and RMCS will initiate a ROD DRIFT alarm.

D. withdraw until the ROD SELECT BLOCK TIMER MALFUNCTION alarm is received, settle at position 16 and then become de-selected.

Answer: A is correct as by design, if the ROD SELECT POWER switch is placed in the OFF position while a rod is being driven, the rod remains selected until the driving cycle is completed.

Distractors B and C are incorrect as the rod is not de-selected until after it is settled normally and the ROD DRIFT alarm is not received.
Distractor D is incorrect as the ROD SELECT BLOCK TIMER MALFUNCTION alarm is not received.

2007 ILT NRC Exam Key
Question 28

Tier: 2 Group: 2
K/A: 201003 CRDM K4.05 3.2 RO
Knowledge of Control Rod Drive Mechanism design features(s) and/or interlocks which provide for the following: Rod position indication.
Reference: B.05.04
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L-021, 2
Source: New

Control rod position indication is provided by which of the following design features?

A. A magnet on the drive piston passing by stationary reed switches.

B. A magnet on the coupling spud passing by stationary reed switches.

C. A reed switch on the drive collet passing by magnets at each control rod notch.

D. The magnetic tip of the position indicator probe activating a reed switch as it passes through the CRDM.

Answer: A is correct as the switches are actuated by a ring magnet carried at the bottom of the drive piston allowing the individual reed switches to be operated by the magnet as the piston passes.

Distractors B, C, and D incorrect, but plausible misconceptions of the design.

2007 ILT NRC Exam Key
Question 29

Tier: 2 Group: 2
K/A: 202002 Recirc Flow Control K5.02 2.6 RO
Knowledge of the operational implications of the following concepts as they apply to Recirc Flow Control System: Feedback signals.
Reference: B.05.08
Reference provided during exam: None
Cognitive level: 1I Objective: M-8107L-047, 8
Source: New

The reactor was operating at rated conditions when the Tachometer on the 11 Recirc MG failed high.

Which of the following describes the operational implications of this failure?

A. There would be no effect as the tachometer only provides a signal for speed indication.

B. The Programmable Logic Controller (PLC) would send a signal to lower the speed of the 11 MG.

C. The Programmable Logic Controller (PLC) would send a signal to raise the speed of the 11 MG.

D. A scoop tube lock would be actuated locking the actuator in its current position.

Answer: D is correct as the tachometer provides a signal for V/Hz control as a feedback signal for speed control and indication on C04. Loss of this signal results in a scoop tube lock initiated by the PLC.

Distractor A is incorrect as the tach provides speed indication and feedback to the scoop tube lock logic.
Distractors B and C are plausible effects of the tachometer signal failure as speed feedback was utilized in MG speed control prior to the modification for PLCs.

2007 ILT NRC Exam Key
Question 30

Tier: 2 Group: 2
[NOTE: A clarification was made to the exam during exam administration. In the question stem, the phrase "The 11 RBM …" was changed to "The 7 RBM …" as shown below.]

K/A: 215002 RBM K6.04 2.8 RO
Knowledge of the effect that a loss or malfunction of the following will have on the RBM system: APRM reference channel.
Reference: B.05.01
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L-057, 8
Source: New

APRM channel 3 was bypassed with the reactor at rated conditions. What effect will this action have on the RBM system?

The ~~11~~ **7** RBM…

A. will be INOP due to a loss of its reference APRM.

B. reference APRM will automatically shift to APRM channel 2.

C. reference APRM will automatically shift to APRM channel 4.

D. reference APRM will automatically shift to APRM channel 5.

Answer: B is correct as when APRM channels 3 or 4 are bypassed, the APRM reference power signal to the associated RBM channel will be automatically switched to the alternate source. The alternate source for APRM channel 3 is APRM channel 2, and the alternate source for APRM channel 4 is APRM channel 5.

Distractors A, C, and D are plausible misconceptions of the above design feature.

2007 ILT NRC Exam Key
Question 31

Tier: 2 Group: 2
K/A: 226001 RHR: CTMT SPRAY A1.02 3.4 RO
Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: Containment Spray System Mode controls including: Drywell Temperature.
Reference: C.5-3502, B.03.04
Reference provided during exam: Drywell Spray Limit curve figure N
Cognitive level: 3SPK Objective: M-8114L-005, 4
Source: New

A plant transient was in progress with the following conditions present:

- D/W pressure 15 psig and rising
- D/W temperature 285°F and rising
- RPV water level -175 inches and slowly lowering
- RPV pressure 850 psig
- All Control rods are fully inserted
- EOPs 1100 and 1200 have been entered and are being executed
- The SAMGs have not been entered
- Drywell spray is directed to be placed in service

Which of the following predicts the impact on Drywell temperature and why?

A. Drywell temperature would continue to rise; Drywell Spray is NOT ALLOWED as plant conditions are outside the Drywell Spray Limit curve.

B. Drywell temperature would lower; as Drywell Spray IS ALLOWED to be initiated by placing the Containment Spray/Cooling LPCI Initiation switch in Bypass and opening the Drywell Spray inboard and outboard isolation valves.

C. Drywell temperature would continue to rise since neither Drywell Spray inboard or outboard isolation valve is allowed to be opened under these plant conditions.

D. Drywell temperature would lower as drywell spray is allowed to be initiated by placing both the Containment Spray 2/3 Core Height Bypass and Containment Spray/Cooling LPCI Initiation switches in BYPASS, and then opening the Drywell Spray inboard and outboard isolation valves.

Answer C is correct as both D/W spray inboard and outboard valves are interlocked to NOT open when RPV water level is less than 2/3 height. This setpoint is at -174 inches. Procedurally these valves are not allowed to be opened unless the TSC is manned and the SAMGs have been entered.
Distractors A, B, and D represent plausible misconceptions of the system design characteristics and the 2/3 height setpoint and procedural limitations.

2007 ILT NRC Exam Key
Question 32

Tier: 2 Group: 2
K/A: 234000 Fuel Handling A2.02 3.1 RO
Ability to (a) predict the impacts of the following on the Fuel Handling Equipment; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of refueling platform air system.
Reference: D.2-02
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L-019, 1
Source: Bank, significantly modified

During a refueling outage, a control rod was being installed into the core with the Control Rod Grapple. As the rod was being inserted, the refueling air system failed causing a rapid loss of air pressure.

Predict the impact that this will have on the control rod installation, and what method, if any, can be used to mitigate the consequences of this condition?

A. The air supply to the Control Rod Grapple will shift to the plant air system via check valve actuation and the rod may be unlatched normally.

B. The control rod will remain coupled to the Control Rod Grapple and air must be restored enabling the rod to be lowered into the core and to unlatch the rod.

C. The Control Rod Grapple air supply valve automatically closes upon low air pressure to maintain grapple air pressure and the rod may be unlatched normally.

D. The control rod will remain coupled to the Control Rod Grapple and the rod must be lowered into the core and the manual unlatching ring can be actuated to unlatch the rod.

Answer: D is correct as once the rod is latched, it cannot be unlatched without air pressure unless the manual unlatching ring is activated.

Distractor A is incorrect as an automatic cross-tie does not exist for the refueling air system.
Distractor B is incorrect as a manual release is possible with the weight off the grapple (rod lowered into the core) and the manual unlatching ring actuated.
Distractor C is incorrect as the grapple does not retain air via an auto valve closure upon a loss of air pressure.

2007 ILT NRC Exam Key
Question 33

Tier: 2 Group: 2
K/A: 245000 Mn Turbine / Generator and Aux. A3.01 3.6 RO
Ability to monitor automatic operations of the Main Turbine Generator and Auxiliary Systems including: Turbine trip.
Reference: B.06.01
Reference provided during exam: None
Cognitive level: 2RI Objective: M-8107L-013, 7
Source: New

A Main Turbine start and roll was in progress following a refueling outage. With turbine rpm passing through the first critical speed, vibrations resulted in a bus 15 lockout.

Which of the following actions would you expect to observe while monitoring panels in the main control room resulting from this event?

A. Turbine trip

B. 11 RPS MG trip

C. MPR would take control

D. 13 Service Water pump trip

Answer: A is correct as first critical speed is 1150 rpm. The turbine aux oil pump is powered from the 15 bus, the booster oil pump will not supply sufficient oil pressure until 1600 rpm to support turbine oil pressure needs. The result is a turbine trip on low oil pressure.

Distractor B is incorrect as the 11 RPS MG is powered from non-essential bus power.
Distractor C is incorrect as the EPR would be in control and this would not occur in these conditions. The EPR oil pumps receive power from MCC 142A / LC 104 / 16 bus.
Distractor D is incorrect as the 13 Service Water pump is powered from non-essential bus 14 via LC 102.

2007 ILT NRC Exam Key
Question 34

Tier: 2 Group: 2
K/A: 256000 Condensate A4.03 3.2 RO
Ability to manually operate and/or monitor in the control room: Hotwell level controls.
Reference: B.06.05
Reference provided during exam: None
Cognitive level: 2RI Objective: M-8107L-068, 7
Source: New

The reactor was operating normally at full power when air is lost to all Hotwell Level Control Makeup and Reject valves.

What will be the observed result of this failure on Hotwell Level if reactor power is held constant and why?

Hotwell level will…

A. rise as the Makeup valves fail OPEN on a loss of air.

B. lower as the Reject valves fail OPEN on a loss of air.

C. lower as both Makeup and Reject valves fail CLOSED.

D. remain unchanged as both Makeup and Reject valves fail CLOSED.

Answer: C is correct as during normal operations the makeup valve is partially open to maintain Hotwell level. The makeup and reject control valves are designed to fail closed on loss of air or control power.

Distractors A, B and D are incorrect as these represent plausible but incorrect variations on observed hotwell level based on differing failure modes of Hotwell level control valves.

2007 ILT NRC Exam Key
Question 35

Tier: 2 Group: 2
K/A: 259001 Feedwater 2.2.2 4.0 RO
Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.
Reference: B.05.07
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L- 0046, 7
Source: New

During a reactor startup, a transfer from the FW LOW FLOW REG VALVE to the A MAIN FW REG VALVE is required. Caution must be exercised during the manual operation of these valve controllers as…

A. the controller pushbuttons are two speed in the OPEN direction ONLY.

B. the controller pushbuttons are two speed in the CLOSE direction ONLY.

C. the controller pushbuttons are two speed in both the OPEN and CLOSE direction.

D. the longer each pushbutton is held in the OPEN or CLOSE direction, the faster the signal changes.

Answer: C is correct as feedwater controllers have two speed controlling functions, depressing the open or close pushbuttons halfway will cause slower response than depressing the buttons fully.

Distractors A, B and C are incorrect as these represent plausible but incorrect variations on the operation of these controllers during operation from shutdown and designated power levels.

2007 ILT NRC Exam Key
Question 36

Tier: 2 Group: 2
K/A: 272000 Radiation Monitoring K1.09 3.6 RO
Knowledge of the physical connections and/or cause-effect relationships between Radiation Monitoring System and the following: PCIS.
Reference: B.05.11
Reference provided during exam: None
Cognitive level: 1I Objective: M-8107L-070, 6
Source: Bank, minor edits

The plant was operating in MODE 2 when the following annunciators actuated:

- 3-B-8 (MAIN STEAM LINE HI RADIATION)
- 3-B-17 (MAIN STEAM LINE CH A HI RADIATION)
- 3-B-32 (MAIN STEAM LINE CH B HI RADIATION)

The alarm conditions are now cleared. What action(s), if any, must the operator take to restart the Mechanical Vacuum Pump?

A. PCIS Group 1 isolation switch must be reset ONLY

B. PCIS Group 2 isolation switch must be reset ONLY

C. PCIS Groups 1 **AND** 2 isolation switches must be reset

D. No actions are required, reset is automatic when the condition clears

Answer: B is correct as one upscale trip from each protective logic channel will initiate a Main Condenser Vacuum pump shutdown and suction valve closure. The upscale trip circuits do not automatically reset and must be reset with the Group 2 reset handswitch. The downscale trips do automatically reset.

Distractors A, C, and D are all plausible, but incorrect plausible misconceptions of this event.

2007 ILT NRC Exam Key
Question 37

Tier: 2 Group: 2
K/A: 286000 Fire Protection K2.02 2.9 RO
Knowledge of the electrical power supplies to the following: Pumps.
Reference: B.08.05
Reference provided during exam: None
Cognitive level: 2RI Objective: M-8107L-040, 7
Source: New

The reactor is operating in MODE 1 with LC 109 X-tied to LC 102.

Which of the following Fire Protection pumps would be available if a lockout condition existed on Bus 13 (assuming no operator action)?

A. Jockey

B. Electric

C. Jockey and Screen Wash

D. Electric and Screen Wash

Answer: B is correct as the Electric F.P. is powered from LC-104 which is powered from Bus 16. On a bus 13 lockout, LC 109 or LC 101 would automatically transfer to being fed from LC 102 via a relay race, but since LC 109 was already powered from LC 102, LC 109 would remain energized and LC 101 would not auto x-tie.

Distractor A is incorrect as the Jockey F.P. is powered from MCC 113 which is powered from LC-101 which is powered from Bus 13.
Distractor C is incorrect as the Jockey F.P. is powered from MCC 113 which is powered from LC-101which is powered from Bus 13.
Distractor D is incorrect as the Screen Wash / Electric F.P. is powered from LC-101 which is powered from B 13.

2007 ILT NRC Exam Key
Question 38

Tier: 2 Group: 2
K/A: 290003 Control Room HVAC K3.04 2.8 RO
Knowledge of the effect that a loss or malfunction of the Control Room HVAC will have on the following: Control room pressure.
Reference: M-8107L-049, Obj 7, B.08.13
Reference provided during exam: None
Cognitive level: 2RI
Source: 2005 NRC ILT Exam

The following conditions exist:

- Control Room Ventilation is in Normal Mode B
- Filter Train Fan V-ERF-12 Selector Switch is in AUTO LEAD

What would be the final condition of the following components/parameters if the Outside Air Intake Rad Monitors RM-9021A and RM-9021B failed upscale?

	Air Conditioner B V-EAC-14B	Return Air Fan B V-ERF-14B	12 Filter Train Fan V-ERF-12	Control Room Press to Admin/Rx bldg ΔP
A.	Running	Running	Running	Positive
B.	Running	Running	Off	Negative
C.	Running	Running	Running	Negative
D.	Off	Off	Running	Positive

Answer: A is correct as Rad monitors RM-9021A and RM-9021B initiate the High Radiation Mode of CRV/EFT at grater than or equal to 1 mr/hr. The High Radiation mode would start the EFT fan that was in Lead and the CRV Normal Mode B fans/air conditioners would remain running. The supply of outside air should pressurize the Control Room with respect to all adjacent areas.

Distractors B and C are incorrect as the control room pressure is designed to remain positive in this condition.
Distractor D is incorrect as ALL three fans would be running in this mode.

2007 ILT NRC Exam Key
Question 39

Tier: 1 Group: 1
K/A: 295001 Partial or Complete Loss of Forced Core Flow Circulation
2.4.48 3.5 RO
Ability to interpret control room indications to verify the status and operation of system / and understand how operator actions and directives affect plant and system conditions.
Reference: C.4-B.05.02.01.A
Reference provided during exam: Power-Flow map from C.4-B.05.02.01.A fig 1
Cognitive level: 3SPR Objective: M-8114L-002, 1
Source: New

The reactor was operating at rated conditions with a total core flow of 51 MLb/Hr when the 12 Reactor Recirc Pump tripped. Three minutes later, reactor power is 72% and indications for the Reactor Recirc system are shown on Panel C-04 in the following pictures.

What region of the power to flow map is the plant currently in and what actions, if any, are now required to ensure the potential for neutron flux oscillations are avoided?

A. The Buffer region has been entered; restart the 12 Reactor Recirc Pump to exit the Buffer region.

B. The Exclusion region has been entered; raise speed of the 11 Reactor Recirc Pump to exit the Exclusion and Buffer regions.

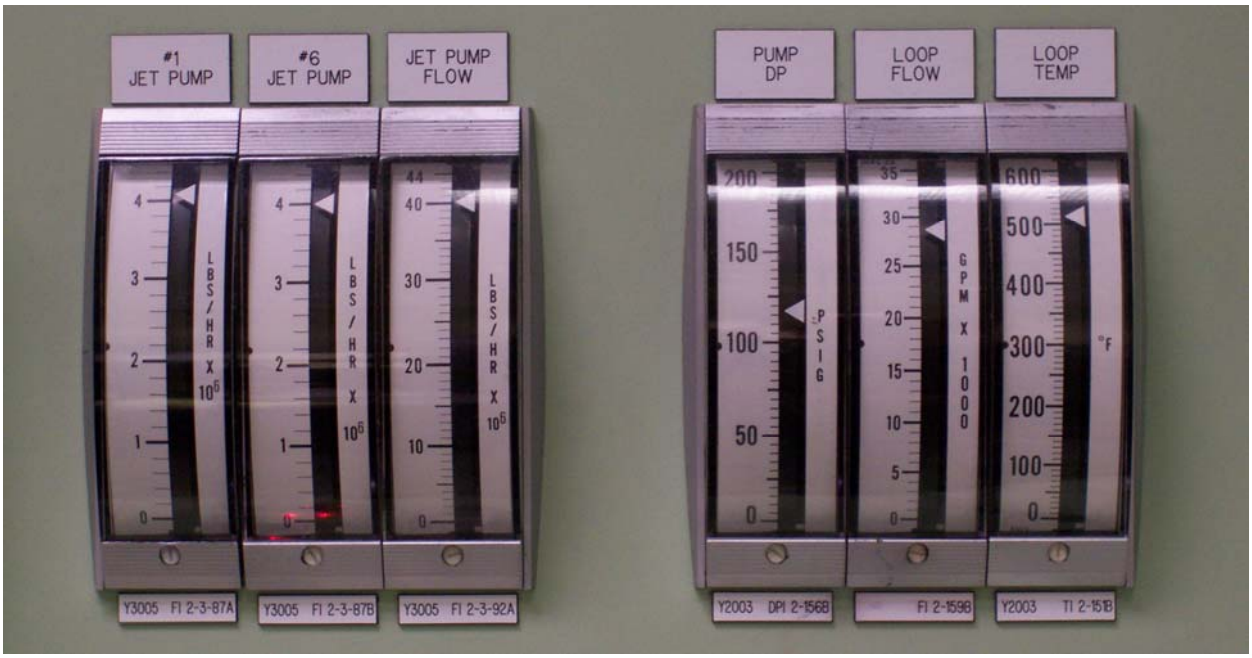
C. The Buffer region has been entered; insert Control Rods to exit the Buffer region.

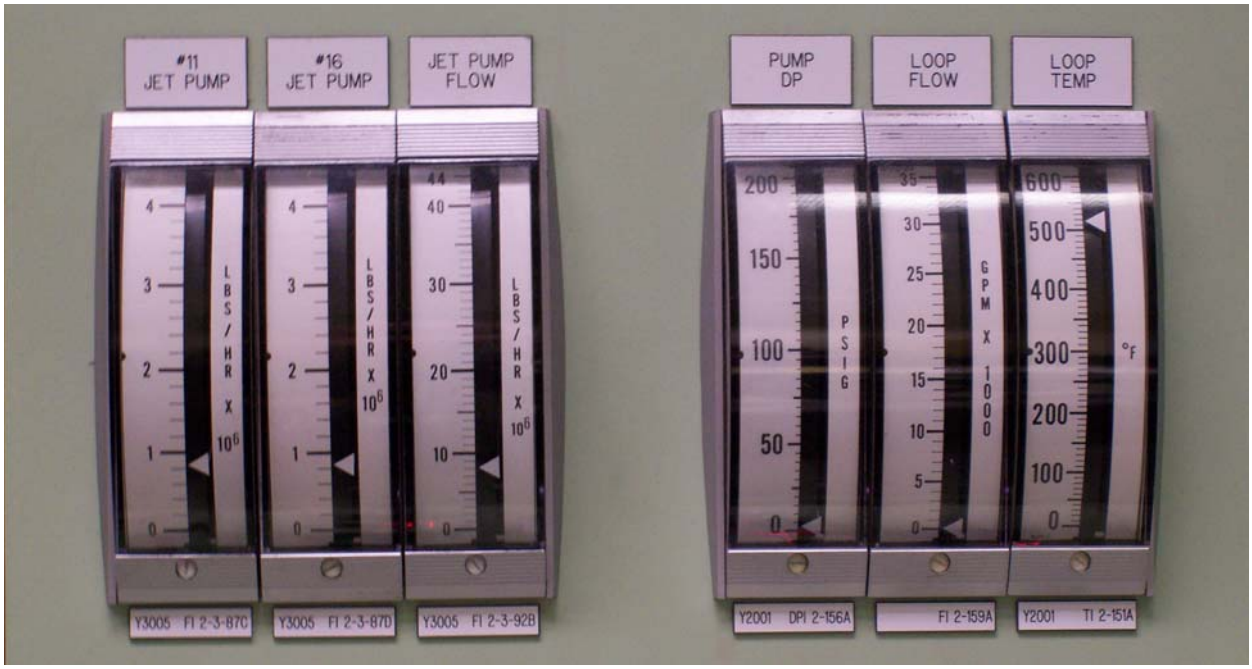
D. The plant is operating in the Normal Region; no further action is required.

Answer: C is correct as the indications show entry into the Buffer region of the Power-flow map. Entry into this region require exiting by either raising core flow or inserting control rods. To calculate core flow 11 Jet Pump Flow must be subtracted from 12 Jet Pump Flow which would give a core flow of 32 MLb/hr.

Distractor A is incorrect as starting a tripped recirc pump is not an acceptable means of exiting the buffer or exclusion region.
Distractor B is incorrect as the exclusion region has not been entered.
Distractor D is incorrect as the buffer region has been entered.

2007 ILT NRC Exam Key
Question 39 Pictures





2007 ILT NRC Exam Key
Question 39 Pictures

2007 ILT NRC Exam Key
Question 40

Tier: 1 Group: 1
K/A: 295003 Partial or Complete Loss of A.C AK1.06 3.8 RO
Knowledge of the operational implications of the following concepts as they apply to Partial or Complete Loss of A. C. Power: Station blackout.
Reference: C.4-B.09.02.A
Reference provided during exam: None
Cognitive level: 2 RI Objective: M-8114L-003, 1
Source: New

The reactor was operating in MODE 1 at rated conditions when a Station Blackout occurred.

What is the expected strategy implemented to control RPV pressure?

A. RPV pressure is lowered to facilitate a cooldown by manual SRV operation not to exceed 97°F per hour.

B. RPV pressure is lowered to facilitate a cooldown by manual SRV operation, it is O.K. to exceed 97°F per hour.

C. RPV pressure is maintained as high as possible with Low-Low Set, but less than 1056 psig to facilitate HPCI and RCIC operation.

D. RPV pressure is maintained as high as possible but less than 1056 psig using Turbine Bypass Valves to facilitate HPCI and RCIC operation.

Answer: C is correct as HPCI and RCIC are the only injection sources available until power is restored. RPV pressure is maintained as high as possible with Low-Low Set, but less than 1056 psig to facilitate HPCI and RCIC operation.

Distractor A is incorrect as no normal cooldown should be performed.
Distractor B is incorrect as anticipation of Emergency Depressurization should not be performed.
Distractor D is incorrect as the Main Turbine Bypass Valves would not be available under a Station Blackout condition.

2007 ILT NRC Exam Key
Question 41

Tier: 1 Group: 1
K/A: 295004 Partial or Complete Loss of D.C AK2.03 3.3 RO
Knowledge of the interrelations between Partial or Complete Loss of D. C. Power and the following: D.C. bus loads.
Reference: C.4-B.09.11.A
Reference provided during exam: None
Cognitive level: 2RI Objective: M-8114L-003, 1
Source: New

The reactor was operating in MODE 2 when a loss of 24 Vdc Distribution Panel D25 occurred.

What action(s), if any, are expected to occur?

The affected SRM and IRM recorders would indicate…

A. downscale and a control rod block ONLY would occur.

B. as is and no further action would be expected to occur.

C. as is and a control rod block and half Reactor Scram on RPS bus B.

D. downscale and a control rod block and half Reactor Scram on RPS bus B.

Answer: D is correct as in MODE 2 the Reactor Mode Switch is in the STARTUP position which would result in a control rod block as SRMs 23 & 24 AND IRMs 15, 16, 17 & 18 would indicate failed low, and would also generate a HI HI/INOP trip.

Distractor A is incorrect as although a rod block would occur, a half scram would also occur.
Distractor B is incorrect as a rod block and a half scram would occur and the recorders would be downscale. This is plausible as potential confusion with recorder power and instrument power supplies may occur.
Distractor C is incorrect as indication on the recorders would be downscale. This is plausible as potential confusion with recorder power and instrument power supplies may occur.

2007 ILT NRC Exam Key
Question 42

Tier: 1 Group: 1
K/A: 295005 Main Turbine Trip AK3.01 3.8 RO
Knowledge of the reasons for the following responses as they apply to Main Turbine Trip: Reactor scram.
Reference: ITS Bases 3.3.1.1
Reference provided during exam: None
Cognitive level: 1B Objective: M-8107L-072, 6
Source: New

At rated conditions, a Main Turbine trip initiates a Reactor Scram in order to ensure the…

A. RPV pressure allowable value limit is not exceeded.

B. RPV pressure safety limit is not exceeded.

C. MCPR safety limit is not exceeded.

D. APLHGR LCO is met.

Answer: C is correct as the turbine stop valve closure function is the primary scram signal for the turbine trip event analyzed in the UFSAR. For this event, the reactor scram reduces the amount of energy required to be absorbed this ensures that the MCPR safety limit is not exceeded.

Distractors A and B are incorrect as although the scram anticipates reactor high pressure conditions, it is not based on exceeding this safety limit or allowable value.
Distractor D is incorrect as although APLHGR is a thermal limit as is MCPR, it is not the reason for this trip.

2007 ILT NRC Exam Key
Question 43

Tier: 1 Group: 1
K/A: 295006 SCRAM AA1.05 4.2 RO
Ability to operate and/or monitor the following as they apply to Scram: Neutron monitoring system.
Reference: B.05.01, C.1
Reference provided during exam: None
Cognitive level: 3SPK Objective: M-8113L-001, 2
Source: New

During a reactor startup the 11 IRM indicates 30 on the 125 scale on range 3, and reactor period is 90 seconds.

Approximately how long would it take to reach the scram setpoint? (Assume no operator action)

A. 35 seconds

B. 65 seconds

C. 125 seconds

D. 180 seconds

Answer: C is correct as with a reactor period of 90 and 2 doubling times, (30-60 and 60-120). This time would be 62.37 seconds times 2. The scram setpoint would be reached in 124.74 seconds.

Distractor A is incorrect as this would be half the time to the first doubling.
Distractor B is incorrect as this would be the time to the first doubling.
Distractor D is incorrect as this would be twice the period.

2007 ILT NRC Exam Key
Question 44

Tier: 1 Group: 1
K/A: 295016 Control Room Abandonment AA2.06 3.3 RO
Ability to determine and/or interpret the following as they apply to Control Room Abandonment: Cooldown rate.
Reference: C.4-C
Reference provided during exam: Figure 2, Reactor Depressurization Rate
Cognitive level: 3SPR Objective: M-8114L-004, 1
Source: New

The plant was operating at rated conditions when an immediate control room evacuation was required; actions of C.4-C (SHUTDOWN OUTSIDE THE CONTROL ROOM) are being performed. At 1015 the CRS directed the use of SRVs to cooldown the reactor as fast as possible without exceeding 97°F.

Which of the following represents the EARLIEST time that SDC could be placed in service? (C.4-C places SDC in service at 40 psig).

A. 1200

B. 1230

C. 1300

D. 1330

Answer: C is correct as the earliest time would be 1300 (1015 + 165 minutes). SDC is directed to be placed in service at 40 psig per the procedure.

Distractors A, C, and D are incorrect interpretations of the requirement and/or figure 2.

2007 ILT NRC Exam Key
Question 45

Tier: 1 Group: 1
K/A: 295018 Partial or Complete Loss of Component Cooling Water
2.4.47 3.4 RO
Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference materials.
Reference: C.4-B.02.05.A, C.6-006-B-32
Reference provided during exam: None
Cognitive level: 3 SPK Objective: M-8114L-002, 1
Source: New

The reactor was operating at rated conditions when the following sequence of events occurred:

- At time 00:00:00 the following occurred:
  - RBCCW header pressure was 26 psig and lowering
- At time 00:00:10 the following occurred:
  - Immediate Operator Actions of C.4-B.02.05.A (LOSS OF RBCCW FLOW) were begun
- At time 00:01:20 the following occurred:
  - An RBCCW pump was manually started and RBCCW header pressure was 45 psig

Which of the below represents plant conditions 2 minutes later? (Assume only Immediate Operator Actions have been taken)

A. Reactor power 100%, Drywell pressure rising

B. RWCU pump tripped, Drywell temperature stable

C. FPCC pump tripped, Drywell pressure stable

D. Reactor power approximately 60%, Drywell temperature rising

Answer: D is correct as the immediate operator actions require that if RBCCW pressure cannot be restored within 60 seconds that both Recirc pumps be secured and RBCCW be isolated to the Drywell. These action would result in reactor power to be approximately 60% and drywell pressure to begin rising as cooling to the drywell will be lost. RBCCW pumps have an auto start function on low pressure, but operator action is required to secure a pump.

Distractor A is incorrect as the immediate actions require tripping both recirc pumps and reactor power would be approximately 60%.
Distractor B is incorrect as D/W temperature would be rising.
Distractor C is incorrect as drywell pressure would be rising due to the loss of cooling.

2007 ILT NRC Exam Key
Question 46

Tier: 1 Group: 1
K/A: 295019 Partial or Complete Loss of Instrument Air AK2.09 3.3 RO
Knowledge of the interrelations between Partial or Complete Loss of Instrument Air and the following: Containment.
Reference: B.04.01, B.08.04.03
Reference provided during exam: None
Cognitive level: 1F Objective: M-8107L-024, 2
Source: New

With the reactor operating steady state in MODE 1, what effect, if any, will a loss of instrument air have on the Reactor Building to Suppression Pool Vacuum Relief Dampers, AO-2379 and AO-2380?

A. These valves would fail OPEN.

B. These valves would fail CLOSED.

C. No effect as these valves are normally aligned to air and use nitrogen as a backup supply.

D. No effect as these valves are normally aligned to nitrogen and use bottled nitrogen as a backup supply.

Answer: D is correct as nitrogen is normally supplied to both of these valves and is backed up by N2 accumulator supply. Thus upon a loss of instrument air, these valves remain closed under normal steady state conditions. Air is used as the motive force for these valves during shutdown conditions.

Distractor A is incorrect as this would only be true if back N2 were valved out.
Distractor B is incorrect as these valves fail OPEN upon loss of air and N2.
Distractor C is incorrect as nitrogen is the primary supply when in MODE 1.

2007 ILT NRC Exam Key
Question 47

Tier: 1 Group: 1
K/A: 295021 Loss of Shutdown Cooling AK2.07 3.1 RO
Knowledge of the interrelations between Loss of Shutdown Cooling and the following: Reactor recirculation.
Reference: C.4-B.03.04.A
Reference provided during exam: None
Cognitive level: 3SPK Objective: M-8114L-002, 1
Source: New

Which of the following is considered a loss of shutdown cooling?

A. RPV water level at 45 inches with RHR in shutdown cooling injecting into the operating recirc loop.

B. RPV water level at 65 inches with RHR in shutdown cooling injecting into an idle recirc loop and the recirc pump discharge valve closed.

C. RPV water level at 45 inches; RHR in shutdown cooling injecting into the idle recirc loop with the recirc pump suction and discharge valves open.

D. RPV water level at 65 inches; RHR in shutdown cooling injecting into the operating recirc loop.

Answer: C is correct as the following indications are used to determine a loss of normal SDC:

a. RHR system cannot be placed in normal SDC lineup
b. SDC flow is being bypass from the reactor core area:
    1) RPV water level is less than 55 inches and no recirculation pumps are running.
    2) An idle recirc pump suction or discharge valve is not fully closed and SDC flow is being injected into that recirculation loop.

Distractors A, B, and D are incorrect as these are all acceptable SDC flow conditions.

2007 ILT NRC Exam Key
Question 48

Tier: 1 Group: 1
K/A: 295023 Refueling Accidents AK3.01 3.6 RO
Knowledge of the reasons for the following responses as they apply to refueling Accidents: Refueling Floor Evacuations.
Reference: D.2-5
Reference provided during exam: None
Cognitive level: 1P Objective: M-8107L-019, 6
Source: 2005 Audit Exam, minor modifications

Fuel Bundles are being shuffled inside the Spent Fuel Pool. It has been reported to the control room that a fuel bundle has come in contact with the side of the pool. The following conditions now exist:

- Annunciator 4-A-1 (REFUELING FL AREA HI RADIATION) is in alarm
- RM-17-453A, Fuel Pool Monitor Channel A, indicates 30 mr/hr and rising
- RM-17-453B, Fuel Pool Monitor Channel B, indicates 25 mr/hr and rising

Which one of the following is the correct response to these conditions?

A. Verify SBGT automatically initiated to minimize the potential release outside the Reactor Building.

B. Evacuate the Refuel Floor **ONLY** to reduce personnel exposure.

C. Evacuate the Reactor Building **AND** the Refuel Floor to reduce personnel exposure.

D. Monitor local ARM readings and evacuate the refuel floor if indications approach 50 mr/hr.

Answer: C. is correct because with the Hi ARM alarms, all personnel in the R.B. will leave at once. If only the Refuel Bridge rad. Alarm sounds, R.B. evacuation is not required. In this case the cause of the alarm should be investigated.

Distractor A is incorrect as SBGT would not be initiated automatically until RM-17-453A or B reached 50 mr/hr.
Distractor B is incorrect, as the R.B. should also be evacuated.
Distractor D is incorrect as this would only be the case if only the Refuel Bridge ARM alarmed.

2007 ILT NRC Exam Key
Question 49

Tier: 1 Group: 1
K/A: 295024 High Drywell Pressure EA1.07 3.8 RO
Ability to operate and/or monitor the following as they apply to High Drywell Pressure: PCIS/NSSSS.
Reference: B.05.06
Reference provided during exam: None
Cognitive level: 1l Objective: M-8107L070, 6
Source: New

The reactor is in MODE 1 with Test 0213, DRYWELL TO SUPPRESSION CHAMBER VACUUM BREAKER LEAKAGE OPERATION CHECK, in progress. Keylock switch 16A-S53, Containment Vent Run Mode Intlk, is in BYPASS. The following valves are open:

- AO-2377, Drywell & Torus Purge Otbd Isol
- AO-2381, Drywell Purge Inbd Isol

If Drywell pressure would exceed 2 psig given the above plant conditions, what would be the affect on these valves?

A. These valves would close due to the group 2 isolation signal.

B. These valves would remain open due to the keylock switch being in BYPASS.

C. These valves would remain open until the Mode Switch is taken out of RUN.

D. These valves would remain open until the Mode Switch is taken to SHUTDOWN.

Answer: A is correct as the containment vent and purge valves close on high drywell pressure or low RPV water level. They also are isolated by an upscale or two downscale trips of the Reactor Building Ventilation Plenum or fuel Pool Monitor. These valves also isolate if the Reactor Mode Switch is placed in Run. To allow these valves to be opened for inerting or operation during the Run mode, a key locked switch is used to bypass the run mode interlock. These valves will automatically close during a group 2 isolation regardless of the position of the bypass switch.

Distractors B, C, and D are plausible misconceptions of the logic for these valves and the impact associated with the keylock switch with a group 2 signal present.

2007 ILT NRC Exam Key
Question 50

Tier: 1 Group: 1
K/A: 295025 High Reactor Pressure EA2.03 3.9 RO
Ability to determine and/or interpret the following as they apply to High Reactor Pressure: Suppression pool temperature.
Reference: C.5.1-1000
Reference provided during exam: Heat Capacity Limit Curve
Cognitive level: 3SPR Objective: M-8114L-005, 3
Source: New

An ATWS condition is in progress with the following conditions present:

- Reactor power is cycling between 30% and 60%
- The MSIVs are closed

Which of the following combination of plant parameters are within the Heat Capacity Limit?

	RPV Press	**Torus Temp**	**Torus Level**
A.	900 psig	180°F	4 inches
B.	950 psig	190°F	-2 inches
C.	1000 psig	165°F	-5 inches
D.	1050 psig	175°F	0 inches

Answer: D is correct as these parameters are within the curve.

Distractors A, B, and C are above the acceptable limit based upon their respective combination of plant parameters.

2007 ILT NRC Exam Key
Question 51

Tier: 1 Group: 1
K/A: 295026 Suppression Pool High Water Temperature 2.1.11 3.0 RO
Knowledge of less than one hour technical specification action statements for systems.
Reference: ITS Section 3.6.2.1
Reference provided during exam: None
Cognitive level: 1F Objective: M-8108L-003, 3
Source: New

The reactor is operating in MODE 2 with #1 Turbine Bypass Valve ~90% open. HPCI is in operation due to surveillance testing. Which one of the following would require an immediate ITS action to be initiated to suspend HPCI testing?

Torus average temperature…

A. >85°F but <90°F

B. >90°F but <95°F

C. >95°F but <100°F

D. >100°F but <105°F

Answer: D is correct as with torus temperature >100°F and thermal power >1% and performing testing that adds heat to the torus, all testing that adds heat to the suppression pool must be suspended.

Distractors A, B, and C are plausible misconceptions of this <1hour ITS requirement.

2007 ILT NRC Exam Key
Question 52

Tier: 1 Group: 1
K/A: 295028 High Drywell Temperature EK1.02 2.9 RO
Knowledge of the operational implications of the following concepts as they apply to High Drywell Temperature: Equipment environmental qualification.
Reference: EOP-1200
Reference provided during exam: None
Cognitive level: 1B Objective: M-8114L-005, 3
Source: New

What is the basis for performing a blowdown when Drywell temperature cannot be restored and maintained below 281°F when taking actions per EOP-1200, Primary Containment Control?

To prevent exceeding the…

A. Drywell spray limit.

B. ADS EQ temperature limit.

C. RPV water level instrument limit.

D. LPCI injection valve EQ temperature limit.

Answer: B is correct as if D/W temperature cannot be maintained or restored below 281°F (D/W design temperature) a blowdown will ultimately be required. High D/W temperature conditions challenge ADS qualification and drywell integrity.

Distractor A is incorrect as this is a function of the DSL curve and sprays can be used in a saturated drywell condition.
Distractor C is incorrect as although this is a concern to the operators, there is no tie to this phenomena to the basis.
Distractor D is incorrect as although these valves are in the D/W, they are not the limiting component.

2007 ILT NRC Exam Key
Question 53

Tier: 1 Group: 1
K/A: 295030 Low Suppression Pool Water Level EK2.08 3.5 RO
Knowledge of the interrelations between Low Suppression Pool Water Level and the following: SRV discharge submergence.
Reference: C.5.1-2002
Reference provided during exam: None
Cognitive level: 1F Objective: M-8114L-005, 3
Source: New

Opening the SRVs to initiate a Blowdown with torus water level below the SRV discharge submergence level would result in which of the following?

A. SRV tail pipe damage due to pipe whip.

B. SRV tail pipe damage potentially resulting in a stuck open SRV.

C. Steam discharge passing directly into the torus air space and raising primary containment pressure.

D. Steam discharge passing directly into the torus air space resulting in a negative pressure in the primary containment if sprays are in service.

Answer: C is correct as this elevation is the top of the SRV discharge devices. If torus water level were not above the top of the SRV discharge devices, steam discharged through the valves would pass directly into the torus air space raising primary containment pressure.

Distractors A, B, and D are plausible, but incorrect reasoning for establishment of the minimum torus level for opening SRVs.

2007 ILT NRC Exam Key
Question 54

Tier: 1 Group: 1
K/A: 295031 Reactor Low Water Level EK3.02 4.4 RO
Knowledge of reasons for the following responses as they apply to Reactor Low Water Level: Core coverage.
Reference: C.5.1-1000
Reference provided during exam: None
Cognitive level: 2DR Objective: M-8114L-005, 2
Source: 2005 ILT NRC Exam

Place the following in the order of preference (most desirable to least desirable) that assures adequate core cooling.

1. RPV water level -120 inches with no injection
2. RPV water level -155 inches with injection from LPCI
3. RPV water level -165 inches with full Core Spray injection

A. 1, 2, 3

B. 2, 1, 3

C. 3, 2, 1

D. 1, 3, 2

Answer: D. Submergence is the preferred method for cooling the core. The core is adequately cooled by submergence if RPV water level is above the top of the active fuel. The order of preference is core submergence, 2/3 height with Core Spray injection, steam cooling with injection.

Distractor A is incorrect, as 2/3 core height with Core Spray is preferred over steam cooling with injection.
Distractors B and C are incorrect because they do not begin with core submergence

2007 ILT NRC Exam Key
Question 55

Tier: 1 Group: 1
K/A: 295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown EK1.07 3.4 RO
Knowledge of the operational implications of the following concepts as they apply to SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown: Shutdown margin.
Reference: EOP-1100, ITS
Reference provided during exam: None
Cognitive level: 2DS Objective: M-8114L-005, 2
Source: New

Which of the following demonstrates sufficient shutdown margin to allow exit from EOP 2007 without concurrence from Nuclear Engineering?

A. All control rods at position -- **EXCEPT** 22-31 at position 48

B. All control rods at position 02 **EXCEPT** 22-31 at position 06

C. All control rods at position 04 **EXCEPT** 22-31 at position 48

D. All control rods at position 06 **EXCEPT** 22-31 at position 04

Answer: A is correct as position – is the insert overtravel position where it is expected that all controls rods will achieve immediately after a scram and then settle back into the 00 position after pressure bleeds down after a few minutes. This would occur if a subsequent scram was performed and was successful during an ATWS condition. Shut down margin is assured when all control rods are inserted to position 00 with the analytically highest worth control rod fully withdrawn.

Distractor B is incorrect as all rods need to be inserted to 02 or beyond to assure shutdown.
Distractor C is incorrect as all other rods would have to be at 00 for this to be correct.
Distractor D is incorrect as all rods need to be inserted to 04 or beyond to assure shutdown.

2007 ILT NRC Exam Key
Question 56

Tier: 1 Group: 1
K/A: 295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown EA1.03 4.1 RO
Ability to operate and/or monitor the following as they apply to SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown: ARI/RPT/ATWS.
Reference: B.05.06
Reference provided during exam: None
Cognitive level: 1I Objective: M-8107L-071, 4
Source: 2006 LOR Biennial Exam

A scram condition is present and reactor power is above 3%. The OATC has initiated ATWS by arming and depressing both ATWS A MANUAL TRIP **AND** ATWS C MANUAL TRIP control switches on panel C-05. What are the expected system actions?

A. Both Recirc MG field breakers open AND both ARI valves vent

B. Both Recirc MG field breakers open AND the 'A' ARI valve vents

C. ONLY the 11 Recirc MG field breaker opens AND both ARI valves vent

D. No ATWS system actuations occur as no 'B' ATWS channel is tripped

Answer B. is correct as a trip occurring in both sub-channels of logic channel A or channel B will cause an ATWS trip which opens both Recirc MG set generator field breakers and causes control rod insertion by venting the scram air header. Each field breaker is equipped with two trip coils, one connected to logic channel A and the other to channel B. Either trip coil can trip the breaker. Two solenoid valves, SA-3-142A(B), are installed in the scram air header. Energizing either of the valves will vent the header.

Distractor A is incorrect as both ARI valves will not vent in this case, only the A solenoid valve will vent.
Distractor C is incorrect as both Recirc MG field breakers will open
Distractor D is incorrect as the logic is a two-out-of-two-once type

2007 ILT NRC Exam Key
Question 57

Tier: 1 Group: 1
K/A: 295038 High Off-Site Release Rate EA2.03 3.5 RO
Ability to determine and/or interpret the following as they apply to High Off-Site Release Rate: Radiation levels.
Reference: B.05.11-01
Reference provided during exam: None
Cognitive level: 1F Objective: M-8114L-005, 2
Source: New

The reactor was operating in MODE 1 when the following occurred:

- Stack effluent channel A alarm indicates HIGH-HIGH
- Stack effluent channel B alarm indicates INOP

Which of the following actions, if any, are expected from this condition?

A. A group 2 isolation is initiated.

B. No automatic actions are expected to occur.

C. An Off Gas recombiner trip occurs after 30 minutes.

D. Off Gas line, Off Gas line drain, and Compressed gas storage to stack valves close.

Answer: D is correct as Off Gas line, Off Gas line drain, and Compressed gas storage to stack valves close when both monitors go INOP.

Distractors A, B, and C are plausible but incorrect responses for this condition.

2007 ILT NRC Exam Key
Question 58

Tier: 1 Group: 1
K/A: 6000000 Plant Fire on Site 2.4.46 3.5 RO
Ability to verify that the alarms are consistent with the plant conditions.
Reference: ARP 20-A-15, B.08.05
Reference provided during exam: None
Cognitive level: 3SPR Objective: M-8107L-010, 7
Source: New

Given the picture below of the No.1 Transformer Deluge System, which of the following would be consistent with the indications shown?

A. Manual trip pushbutton actuated

B. Annunciator 20-A-8 (FIRE) in alarm

C. Deluge spray at the transformer

D. Annunciator 20-A-15 (FIRE PROTECTION SYSTEM OPERATED) in alarm

Answer: B is correct as this alarm is actuated by the HAD system when temperature exceeds the setpoint.

Distractors A, C, and D are incorrect as these are all different functions associated with manual actuation of the manual trip pushbutton.

2007 ILT NRC Exam Key
Question 59

Tier: 1 Group: 2
K/A: 295002 Loss of Main Condenser Vacuum AA1.03 3.4 RO
Ability to operate and/or monitor the following as they apply to Loss of Main Condenser Vacuum: RPS.
Reference: C.4-B.06.03.A
Reference provided during exam: C.4-B.06.03.A figure 1
Cognitive level: 3 SPR Objective: M-8114L-002, 1
Source: New

The reactor was operating at rated conditions when the following events occurred: (Assume SPDS is NOT available)

- 0700: 5-B-46 (CONDENSER LOW VACUUM) alarm was received
- 0705: 7-B-16 (VAC 24 IN TRIP #1) alarm was received
- 0705: 7-B-17 (VAC 24 IN TRIP #2) alarm was received
- 0708: PR-1264, CONDENSERS A AND B VACUUM, on C-07 indicated 6.1" Hg Abs.
- 0710: PR-1264, CONDENSERS A AND B VACUUM, on C-07 indicates 7" Hg Abs. and remains stable

Given the above information, when is the EARLIEST time a manual Reactor Scram is required to be initiated?

A. 0721

B. 0726

C. 0729

D. 0731

Answer: C is correct as if either LP turbine exhaust pressure is in the ALERT region of figure 1 for longer and 20 minutes, then manually scram the reactor.

Distractors A, B, and D are misconceptions in interpreting figure 1 or failure to understand the significance of long term operation in the ALERT region.

2007 ILT NRC Exam Key
Question 60

Tier: 1 Group: 2
K/A: 295008 High Reactor Water Level AA2.03 2.9 RO
Ability to determine and/or interpret the following as they apply to High Reactor Water Level: Reactor water cleanup blowdown flow.
Reference: C.4-05.07.A, B.02.02
Reference provided during exam: None
Cognitive level: 1F Objective: M-8114L-002, 1
Source: New

The plant just entered MODE 1 during a reactor startup. RWCU is lined up to reject to the condenser hotwell via MO-2404, RWCU DUMP TO HOTWELL.

What is the maximum RWCU system flow allowed during this operation and why?

A. 40 gpm to prevent CV-2403 isolation on low pressure.

B. 40 gpm to prevent CV-2403 isolation on high pressure.

C. 79 gpm to prevent damage to the regenerative heat exchanger.

D. 79 gpm to prevent damage to the non-regenerative heat exchanger.

Answer: D is correct as this method to control RPV water level during a startup with a rising RPV water level is to reject with RWCU. During a maximum blowdown, when all cleanup flow is routed to the condenser, no cooling water is available to the regenerative heat exchangers. To protect the non-regenerative heat exchangers, cleanup system flow must be limited to 79 gpm as indicated on FI-12-140 on C04.

Distractors A and B are incorrect as the dump flow isolations to protect the RWCU piping and condenser vacuum are not challenged in this evolution. Distractor C is incorrect as the flow rate limit is 79 gpm and the non-regenerative heat exchanger is the concern.

2007 ILT NRC Exam Key
Question 61

Tier: 1 Group: 2
K/A: 295012 High Drywell Temperature 2.4.8 3.0 RO
Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.
Reference: C.5-3503, C.4-H
Reference provided during exam: None
Cognitive level: 2RI Objective: M-8114L-004, 1
Source: New

The plant was in a normal lineup when a transient occurred with the following conditions present:

- 1AR transformer is supplying 15 and 16 Buses
- Drywell pressure is 5.5 psig and rising
- Drywell temperature is 185°F and rising

You have been directed to start all available drywell cooling. Which of the below describes the actions you must take to place all D/W fans in service?

A. The ECCS Load Shed must be bypassed and all D/W fans must be restarted.

B. Essential Bus Transfer Load Shed must be bypassed and all D/W fans must be restarted.

C. No actions are required as Mode 5 “Scram Mode” is automatically initiated on high temperature in the control rod drive area.

D. Three D/W cooling fans will automatically restart, the fourth control switch must be taken from the STBY to the ON position.

Answer: A is correct as the ECCS Load Shed must be bypassed and all D/W fans must be restarted. The Essential Bus Transfer Load Shed has no effect on D/W fan operation.

Distractors B, C, and D are plausible misinterpretations of the conditions and actions required to place all 4 D/W fans in service.

2007 ILT NRC Exam Key
Question 62

Tier: 1 Group: 2
K/A: 295014 Inadvertent Reactivity Addition AK1.05 3.7 RO
Knowledge of the operational implications of the following as they apply to Inadvertent Reactivity Addition: Fuel thermal limits.
Reference: B.05.05-05, Plant OE on mispositioned control rod
Reference provided during exam: None
Cognitive level: 1P Objective: M-8107L-021, 9
Source: New

While performing test 0081 (CONTROL ROD DRIVE SCRAM INSERTION TIME TEST) the incorrect control rod was withdrawn from position 14 to 48. The crew recognized the error. What action is required to ensure adequate margin to fuel thermal limits exists?

A. Notify Reactor Engineering to run a predictor and provide a recovery plan.

B. Obtain fuel thermal limit information before any rod recovery is performed.

C. Insert the control rod to its previous position without obtaining information on fuel thermal limits.

D. Fully insert the control rod to position 00 and obtain further guidance from Reactor Engineering.

Answer: C is correct as abnormal procedure Recovery from an Inadvertent Control Rod Withdrawal should be applied as soon as possible following the inadvertent withdrawal. If reactor thermal limits were checked prior to rod insertion, and if it was determined that one or more of these margins were outside of its limit, then the required T.S. action would be to initiate action within 15 minutes to return the margin to within its limit within 2 hrs. The best way to do that would be to insert the inadvertently withdrawn rod. However, this is just the action required by the procedure. Therefore, checking thermal margins prior to inserting the mispositioned rod would result in an unnecessary delay in returning the reactor to its desired configuration.

Distractors A and B represent an unnecessary delay to returning the reactor to its desired configuration.
Distractor D action is not required and would result in a rod pattern not within the desired configuration.

2007 ILT NRC Exam Key
Question 63

Tier: 1 Group: 2
K/A: 295015 Incomplete Scram AK2.08 3.6 RO
Knowledge of interrelations between Incomplete Scram and the following: Neutron monitoring system.
Reference: C.4-A, EOP-2007
Reference provided during exam: None
Cognitive level: 3SPK Objective: M-8114L-001, 3
Source: Bank, 2004 LOR Biennial Exam

Given the following:

- A manual scram has been inserted
- The reactor mode switch is in SHUTDOWN
- All rods went to position 00 EXCEPT:
    - Control rod 02-27 which is at position 14
    - Control rod 50-29 which is at position 48
- RPV water level lowered to -5 inches and has now recovered to +20 inches
- All APRMs are downscale and power is lowering on both the IRM and SRM detectors which have been fully inserted

Which is the correct method to be used to insert the control rods?

A. Rescram control rods per C.5-3101 Part D

B. Increase cooling water dP and use RMCS per C.5-3101 Part C

C. Bypass the RWM and use reactor manual control per C.4-A

D. Close valve CRD-14 and use reactor manual control per C.4-A

Answer: C. is correct as actions taken to insert the control rods would be directed from the scram procedure as indication on the nuclear instruments indicate that the reactor is not critical and no indications are present for SBLC being initiated. The two not fully inserted control rods are edge rods at opposite ends of the core.

Distractors A and B are incorrect as they are only used in an ATWS condition. Distractor D is incorrect as this would only apply if the scram could not be reset.

2007 ILT NRC Exam Key
Question 64

Tier: 1 Group: 2
K/A: 295020 Inadvertent Containment Isolation AK3.05 3.8 RO
Knowledge of the reasons for the following as they apply to Inadvertent Containment Isolation: Reactor water level response.
Reference: B.05.06
Reference provided during exam: None
Cognitive level: 3SPK Objective: M-8107L-070, 7
Source: New

The reactor was operating in MODE 1 with RCIC unavailable when a plant transient resulted in the following conditions:

- 4160 KV buses 11 and 12 are de-energized and cannot be restored
- HPCI initiated automatically
- RPV water level is -50 inches and rising
- RPV pressure is 850 psig

If ONE of the HPCI Steam Line Flow sensors inadvertently spiked upscale for 10 seconds and then returned to normal, what would be the effect on RPV water level AND why?

A. No effect as PCIS is a one-out-of-two-twice logic.

B. No effect as the Condensate and Feedwater systems are available.

C. RPV water level would lower as the group 4 logic would be satisfied by the one sensor failure.

D. RPV water level would initially lower and then rise as group 4 logic would automatically reset.

Answer: C is correct as no RFPs are available for injection due to the loss of both 11 and 12 KV buses. There are four exceptions to the PCIS one-out-of-two-twice logic and the HPCI steam line flow is one of them. Any upscale failure of these sensors would result in a group 4 isolation. In this situation, RPV water level response would be to lower on a loss of the HPCI turbine.

Distractors A, B, and D are plausible misunderstandings of the PCIS logic and/or its relationship to HPCI and its effect on RPV water level in this situation.

2007 ILT NRC Exam Key
Question 65

Tier: 1 Group: 2
K/A: 295033 High Secondary Containment Area Radiation Levels
EA1.04 4.2 RO
Ability to operate/monitor the following as they apply to High Secondary Containment Area Radiation Levels: SBGT.
Reference: B.04.02
Reference provided during exam: None
Cognitive level: 1l Objective: M-8107L-006, 5
Source: New

Which combinations of the Reactor Building Vent Exhaust Plenum and Fuel Pool Radiation Monitors would satisfy the SBGT automatic initiation logic?

	Rad Monitor	Indication
A.	Fuel Pool 'A'	downscale
	Fuel Pool 'B'	15 mR/hr
B.	Fuel Pool 'A'	15 mR/hr
	Fuel Pool 'B'	40 mR/hr
C.	Reactor Building Vent Exhaust Plenum 'A'	downscale
	Reactor Building Vent Exhaust Plenum 'B'	20 mR/hr
D.	Reactor Building Vent Exhaust Plenum 'A'	downscale
	Reactor Building Vent Exhaust Plenum 'B'	30 mR/hr

Answer: D is correct as SBGT initiation is provided automatically when the preset limit for Reactor Building Vent Exhaust Plenum radiation monitor, one high or two downscale trips, is received.

Distractors A, B, C are incorrect as these are plausible misinterpretations of the logic arrangement.

2007 ILT NRC Exam Key
Question 66

Tier: 3
K/A: 2.1.20 4.3 RO
Ability to execute procedure steps.
Reference: C.4
Reference provided during exam: None
Cognitive level: 1P Objective: M-8114L-001, 2
Source: New

While performing subsequent action steps from C.4 procedures, steps can be performed concurrently, out of order, or re-performed under which of the following criteria, if any?

A. Never as deviations from C.4 procedures are not allowed.

B. As deemed appropriate by plant conditions and at the discretion of the panel operator.

C. As deemed appropriate by plant conditions and with the authorization of the Control Room Supervisor.

D. As deemed appropriate by plant conditions and with the authorization of the Control Room Supervisor and followed up by processing a temporary change.

Answer: C is correct as the procedures are prepared with the intent of being applicable for a wide variety of plant conditions. It is recognized that the procedures cannot envelop all possible event situations. For a given plant condition, specific steps in the procedures may not be applicable. In these cases, the non-applicable steps may be omitted without processing a temporary change. Subsequent actions are generally written in the order in which they should be performed, however, the order may not be appropriate for all situations. The Control room Supervisor may authorize subsequent actions to be performed concurrently, out of order, or re-performed as plant conditions dictate.

Distractors A, B, and D are potential misconceptions concerning who has the authority to authorize deviation or whether a temp change should be initiated.

2007 ILT NRC Exam Key
Question 67

Tier: 3
K/A: 2.1.32 3.4 RO
Ability to explain and apply system limits and precautions.
Reference: B.03.01
Reference provided during exam: None
Cognitive level: 1P Objective: M-8107L-005, 5
Source: 2005 ILT Audit Exam

During a control room panel walkdown with reactor power 100%, the OATC notes that PI-14-48B, Division 2 Core Spray Pump Discharge Pressure Indicator, reads 25 psig.

What, if any, concern should the OATC have and why?

A. No concern, the normal reading is typically between 25 – 30 psig.

B. No concern, the 12 Core Spray pump is operable if pressure is maintained >20 psig.

C. Concern, the 12 Core Spray discharge piping may experience damage due to water hammer if the pump is started.

D. Concern, the 12 Core Spray pump may experience damage if started due to insufficient NPSH.

Answer: C. is correct as the procedure general cautions require that the piping downstream of the Core Spray pump SHALL be pressurized to 30 psig or greater to ensure operability this prevents damage to the system due to water hammer.

Distractor A is incorrect as normal pressure is 40-50 psig and the pump may not be operable.
Distractor B is incorrect as the procedure general cautions require that the piping downstream of the Core Spray pump SHALL be pressurized to 30 psig or greater to ensure operability.
Distractor D is incorrect as this would be a concern for the pump suction pressure.

2007 ILT NRC Exam Key
Question 68

Tier: 3
K/A: 2.1.25 2.8 RO
Ability to obtain and interpret station reference materials such as graphs / monographs / and tables which contain performance data.
Reference: B.09.02, ARP 8-A-34, Reactive Capability vs. Megawatt Load – Turbine Generator Curve
Reference provided during exam: Reactive Capability vs. Megawatt Load – Turbine Generator Curve
Cognitive level: 3SPR Objective: M-8107L-034, 7
Source: 2006 LOR Biennial Exam

The reactor is operating at power with the following conditions present:

- Reactor power 90% and steady
- 550 MWe
- Delivering 47 MVARs
- Generator H2 pressure 45 psig

Annunciator 8-A-34 (1-BUS 345 KV LOW FREQ) alarms. The Day Trader has been contacted and reactor power can be raised at this time to rated conditions. What is the method and maximum limit allowed to raise Generator load in this situation per the Reactive Capability vs. Megawatt Load – Turbine Generator Curve?

Raise Generator load by _____A_____.

Maximum reactive load for this situation is approximately _____B_____.

	A	B
A.	going to **raise** on recirc flow	210 MVARS
B.	going to **raise** on recirc flow	350 MVARS
C.	going to **lower** on the Regulator Voltage Adjust knob	200 MVARS
D.	going to **raise** on the Regulator Voltage Adjust knob	230 MVARS

Answer: A is correct based on figure 2 of B.09.02-06 (Reactive Capability vs. Megawatt Load – Turbine Generator) at 100 power, 610 MWe.

Distractors B, C, and D are incorrect as they use the incorrect control, or in the incorrect direction, or depict the incorrect VAR limit.

2007 ILT NRC Exam Key
Question 69

Tier: 3
K/A: 2.2.27 2.6 RO
Knowledge of the refueling process.
Reference: D.02-05
Reference provided during exam: None
Cognitive level: 1P Objective: M-8107L-019, 6
Source: 2005 ILT NRC Exam

The unloading of a core cell of all fuel was required to support an inspection during a refueling outage.

Which of the following describes the correct sequence of events to be performed for this refueling process?

A. Install the blade guide, install jumper on Probe Buffer Card to allow bridge movement over the core, remove all fuel assemblies, withdraw the control rod.

B. Remove all fuel assemblies, install the blade guide, withdraw the control rod, install jumper on Probe Buffer Card to allow bridge movement over the core.

C. Unload two diagonal fuel assemblies, insert a blade guide, remove the remaining fuel assemblies, withdraw the control rod, install jumper on Probe Buffer Card to allow bridge movement over the core.

D. Unload two diagonal fuel assemblies, insert a blade guide, withdraw the control rod, remove the remaining fuel assemblies, install jumper on Probe Buffer Card to allow bridge movement over the core.

Answer: C is correct as this method is supports the sequence prescribed in the procedure, which ensures adequate reactivity control of the fuel and physical support of the control rod during this operation.

Distractors A, B, and D are reasonable misconceptions about this process which do not adequately support either reactivity or physical support the core cell components.

2007 ILT NRC Exam Key
Question 70

Tier: 3 **[Question was deleted from Exam]**
K/A: 2.2.22 3.4 RO
Knowledge of limiting conditions for operations and safety limits.
Reference: ITS section 2.0
Reference provided during exam: None
Cognitive level: 1F Objective: M-8108L-003, 2
Source: New

Which of the following describes the MCPR safety limit?

A. With the reactor steam dome pressure < 785 psig AND core flow < 10% rated core flow: Thermal Power shall be ≤ 25% RTP.

B. With the reactor steam dome pressure < 785 psig OR core flow < 10% rated core flow: Thermal Power shall be ≤ 25% RTP.

C. With the reactor steam dome pressure ≥ 785 psig AND core flow ≥ 10% rated core flow: MCPR shall be ≥ 1.12 for two recirculation operation or ≥ 1.10 for single recirculation loop operation.

D. With the reactor steam dome pressure ≥ 785 psig OR core flow ≥ 10% rated core flow: MCPR shall be ≥ 1.12 for two recirculation operation or ≥ 1.10 for single recirculation loop operation.

Answer: B is correct as this meets the requirements stated in ITS.

Distractors A, C, and D are incorrect variations of the MCPR safety limit.

2007 ILT NRC Exam Key
Question 71

Tier: 3
K/A: 2.3.4 2.5 RO
Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized.
Reference: A.2-401
Reference provided during exam: None
Cognitive level: 1P Objective: M-8108-033
Source: 2005 Audit Exam

An emergency was in progress with the TSC activated. You have volunteered for an emergency exposure to protect valuable equipment.

Your exposure is limited to ___(1)___ if authorized by the ___(2)___.

	(1)	(2)
A.	10 Rem (TEDE)	Radiation Protection Coordinator (if delegated)
B.	10 Rem (TEDE)	Radiological Emergency Coordinator (if delegated)
C.	25 Rem (TEDE)	Emergency Director
D.	25 Rem (TEDE)	Radiation Protection Coordinator (if delegated)

Answer: B. is correct as this is valuable equipment, the dose is limited to 10 REM and can only be authorized by the Emergency Director OR Radiological Emergency Coordinator (if delegated).

Distractor A is incorrect as this person cannot be delegated to approve the exposure.
Distractors C and D are incorrect as this is the limit to save a life.

2007 ILT NRC Exam Key
Question 72

Tier: 3
K/A: 2.3.1 2.6 RO
Knowledge of 10 CFR: 20 and related facility radiation control requirements.
Reference: AWI-08.04.01
Reference provided during exam: None
Cognitive level: 3SPK Objective: M-8108L-002, 3
Source: 2005 Audit Exam, significantly modified

You have received 250 mrem so far this calendar year.

Without first line supervisor approval, what is the maximum additional radiation exposure may you receive for the remainder of the year and remain within the MNGP limit?

A. 1000 mrem

B. 1750 mrem

C. 3500 mrem

D. 3750 mrem

Answer: B. is correct as the 10 CFR 20 limit is 5 rem per calendar year. MNGP limit is 40% (2000 mrem) of this limit with first line supervisor approval. You already have received 250, thus the remaining limit for the year is 1750 mrem.

Distractors A, C, and D are incorrect as they reflect differing management approvals.

2007 ILT NRC Exam Key
Question 73

Tier: 3
K/A: 2.4.2 3.9 RO
Knowledge of system set points / interlocks and automatic actions associated with EOP entry conditions.
Reference: EOP-1100, B.03.01, B.03.02, B.03.03, B.03.04, B.05.06
Reference provided during exam: None
Cognitive level: 1F Objective: M-8114L-005, 2
Source: New

The reactor is in MODE 3 due to a transient that resulted in all C.5-1100 entry conditions reaching their respective entry condition set points. (Assume all entry condition parameters are at their setpoint)

Which of the following describes system automatic response to this condition?

A. HPCI and RCIC injection, Groups 2 and 3 isolation, Reactor Scram, ADS timer initiation.

B. HPCI injection, Groups 1 and 3 isolation, Reactor Scram, LPCI loop select logic actuation.

C. Core Spray and LPCI pumps start, SBGT initiation, Reactor Scram, ADS timer initiation.

D. HPCI injection, Core Spray and LPCI pumps start, LPCI loop select logic actuation, Groups 2 and 3 isolation.

Answer: D is correct as HPCI injects, Core Spray and LPCI pumps start high D/W pressure at 2 psig. Groups 2 and 3 isolate at 2 psig. LPCI loop select logic actuation is at 2 psig.

Distractor A is incorrect as RCIC does not receive a start signal until -47 inches and is sometimes thought to have similar initiation signals as HPCI.
Distractor B is incorrect as a group 2 isolation does not occur until -47 inches.
Distractor C is incorrect as the ADS timer does not start until both -47 inches and at least 1 RHR or CS pump is running (discharge pressure >100 psig).

2007 ILT NRC Exam Key
Question 74

Tier: 3
K/A: 2.4.34 3.8 RO
Knowledge of RO tasks performed outside the main control room during emergency operations including system geography and system implications.
Reference: C.5-3102
Reference provided during exam: None
Cognitive level: 3SPK Objective: M-8114L-011, 2
Source: New

Given the following conditions during an ATWS:

- Conditions exist which require boron to be injected
- SLC SYSTEM SELECTOR SWITCH is in the OFF position and will not move
- 15 bus is Locked Out
- Both CRD Flow Control Valves are failed CLOSED

Which of the following pumps would be available to inject boron into the RPV?

A. 12 CRD Pump

B. 11 RWCU pump

C. 12 RWCU pump

D. 12 SBLC pump via the local control switch

Answer: A is correct as C.5-3102 provides direction for alternate boron injection into the RPV. The status of the FCVs is not of consequence as they are bypassed when local valves CRD-8 and 30 are opened.

Distractor B is incorrect as the 11 RWCU pump is unavailable due to the 15 bus lockout.
Distractor C is incorrect as the control panels and valves associated with alignment of the 12 RWCU pump are unavailable due to the bus 15 lockout.
Distractor D is incorrect as operation of the 12 SBLC pump from the local switch does not result in squib valve firing.

2007 ILT NRC Exam Key
Question 75

Tier: 3
K/A: 2.4.16 3.0 RO
Knowledge of EOP implementation hierarchy and coordination with other support procedures.
Reference: C.5-1000
Reference provided during exam: None
Cognitive level: 1P Objective: M-8114L-005, 2
Source: 2006 LOR Biennial Exam, modified

Given the following conditions:

- A plant transient was in progress
- EOPs 1100, 1200, and 2002 have been entered and were being executed
- Conditions continued to deteriorate and the SAMGs were entered
- Several minutes later the HPCI steam line ruptured in the HPCI room and the automatic Group 4 isolation failed

Which of the below actions would you expect the CRS to follow?

A. Exit the SAMGs and enter EOP 1300

B. Enter EOP 1300 and re-enter EOPs 1100 and 1200

C. Continue in the SAMGs as directed by the TSC and enter EOP 1300

D. Continue in the SAMGs as directed by the TSC and **NOT** enter any EOPs

Answer: D is correct as when the SAMGs are entered all EOPs are exited and not re-entered.

Distractors A, B, and C are incorrect as they do not follow the above strategy.

2007 ILT NRC Exam Key
Question 76

Tier: 1 Group: 1
K/A: 295025 High Reactor Pressure EA2.01 4.2 SRO
Ability to determine and/or interpret the following as they apply to High Reactor Pressure: Reactor pressure.
Reference: C.5.1-2007, B.03.03, Objective: M-8114L-005, 4
Reference provided during exam: EOP Flow Charts
Cognitive level: 3SPR 10CFR55.43 Ref: (5)
Source: 2005 ILT Audit Exam, edits to stem

An ATWS exists with the following conditions present:

- Reactor power is cycling between 15-30%
- The MSIVs are closed
- SRVs are cycling on their safety setpoints
- RPV water level is difficult to control
- RPV water level is –39 inches
- RPV water level has not been intentionally lowered
- Torus temperature is 95°F and rising

Which of the below actions would the CRS direct FIRST?

A. Lower RPV pressure to 930 psig by manual operation of SRVs.

B. Stabilize RPV pressure below 1056 with manual operation of SRVs.

C. Stabilize RPV pressure below 1056 with LO-LO-SET operation.

D. Terminate RPV injection from LPCI, HPCI and Condensate / Feedwater.

Answer: A is correct as rapid SRV cycling is taking place due to the lo-lo set SRV cycling with the inability to control a critical plant parameter (RPV water level).

Distractor C is incorrect as these actions would only be taken if it was determined that the SRVs are not rapidly cycling.
Distractor B is incorrect as all operators are involved with higher priority actions and lo-lo set is functioning as designed.
Distractor D is incorrect as pressure is sufficient to have an SRV open, but torus temperature is not 110°F and RPV water level is < -33 inches.

2007 ILT NRC Exam Key
Question 77

Tier: 1 Group: 1
K/A: 295003 Partial or Complete Loss of A.C. Power AA2.02 4.3 SRO
Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of A.C. Power: Reactor power / pressure / level.
Reference: EOP-2007 Objective: M-8114L-005, 4
Reference provided during exam: EOP Flow Charts
Cognitive level: 3SPR 10CFR55.43 Ref: (5)
Source: New

The reactor was operating in MODE 1 with the 12 RPS MG tagged out of service for motor replacement. The 12 RPS bus was being supplied from the Alternate source. 4160 Vac bus 13 experienced a lock out condition, which resulted in the following conditions:

- 3 LLS SRVs are open controlling RPV pressure
- APRMs indicate 0% power
- RPV water is 7 inches and rising
- Torus water level is 0 inches
- Torus water temperature is 107°F and rising

Based on the above conditions, which of the following actions do you direct to mitigate the event?

A. Restore and maintain RPV water level between 9 and 48 inches AND stabilize RPV pressure below 1056 psig with Turbine Bypass Valves.

B. Restore and maintain RPV water level between 9 and 48 inches AND maintain RPV pressure between 900 and 1056 psig using LLS.

C. Maintain RPV water level between -149 and 48 inches AND stabilize RPV pressure below 1056 psig with Turbine Bypass Valves.

D. Prevent RPV injection from Feed and Condensate, HPCI, and LPCI until water level reaches -33 inches AND inhibit ADS.

Answer: D is correct as an ATWS condition exists. 3 SRVs opening to control RPV pressure is an indication that Reactor power is substantially above decay heat levels. APRM power indication is not available due to a loss of both RPS power supplies. EOP-2007 requires these actions.

Distractor A is incorrect as an ATWS condition exists and these actions are IAW EOP 1100.
Distractor B is incorrect as these actions would be EOP-1100 actions.
Distractor C is incorrect as these actions would result from an inaccurate interpretation of the override conditions to go to step 6 vice step 7 of EOP-2007.

2007 ILT NRC Exam Key
Question 78

Tier: 1 Group: 1
K/A: 295016 2.4.23 3.8 SRO
Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.
Reference: C.4-C Objective: M-8114L-004, 1
Reference provided during exam: None
Cognitive level: 1B 10CFR55.43 Ref: (5)
Source: New

The reactor is operating in MODE 1 when a condition occurs that requires entry into C.4-C, SHUTDOWN OUTSIDE CONTROL ROOM. Immediate control room evacuation is NOT required, but is anticipated.

Under what condition, if any, would the CRS direct that the MSIVs be closed prior to leaving the control room?

A. This action would always be directed to prevent RPV depressurization following the scram.

B. This action would always be directed to meet a UFSAR 10 minute action commitment.

C. This action would be directed only if there is major equipment damage that may affect main steam pressure control to prevent rapid RPV depressurization.

D. This action is never taken until control is established at the ASDS panel and an assessment of reactor conditions is made to avoid adding energy to the containment if the main condenser is available.

Answer: C is correct as this ensures the MSIVs are closed to prevent an inadvertent depressurization of the reactor prior to establishing control on Panel C-292. There was a concern involving control of the cooldown by using the Bypass Valves and maintaining the Main Condenser as a heat sink, but in a fire event, there is a chance of a Pressure Regulator failure occurring within the assumed 10 minutes required to establish ASDS control.

Distractors A, B, and D are misconceptions of the bases for this action.

2007 ILT NRC Exam Key
Question 79

Tier: 1 Group: 1
K/A: 295019 2.2.13 3.8 SRO
Knowledge of tagging and clearance procedures.
Reference: FP-OP-TAG-01 Objective: M-8108L-039, 2
Reference provided during exam: None
Cognitive level: 1P 10CFR55.43 Ref: (5)
Source: New

The reactor was operating in MODE 1 with the following conditions present:

- 11 Instrument Air Compressor, K-1A, is in LEAD
- 14 Instrument Air Compressor, K-1D, is in STBY
- 13 Instrument Air Compressor, K-1C, is taggout out for routine maintenance
- It is the 1900-0700 shift
- The Clearance Order Holder is NOT on site
- Instrument air pressure is 95 psig

If K-1A fails and K-1D is determined to NOT be able to maintain long term instrument air header pressure above the low pressure alarm point, what actions are required for the CRS to direct the removal of Danger Tags and place K-1C in service? (Assume instrument air pressure is lowering 1 psig per 30 minutes).

A. Immediately sign off the Clearance Order Holder(s) and direct the tags be removed.

B. With concurrence of the Shift Manager, immediately sign off the Clearance Order Holder(s) and direct the tags be removed.

C. Attempt to contact the Clearance Order Holder(s) and if they cannot be reached, direct the tags be removed.

D. Attempt to contact the Clearance Order Holder(s) and if they cannot be reached, and with permission from the WCC, direct the tags be removed.

Answer: C is correct as the CRS may sign off the applicable clearance order when the clearance order holders are not on site and reasonable attempts are made to notify the employee after it is confirmed that they are not on site. (The Instrument Air Low Press annunciator alarms at 85 psig, thus 5 hours are available for actions to be accomplished.)

Distractors A, C, and D are plausible misconceptions of this procedural requirement.

2007 ILT NRC Exam Key
Question 80

Tier: 1 Group: 1
K/A: 295023 Refueling Accidents AA2.05 4.6 SRO
Ability to determine and/or interpret the following as they apply to Refueling Accidents: Entry conditions of emergency plan.
Reference: USAR Table 14.7-2b, EAL Flow Charts, A.2-101
Reference provided during exam: EAL Flow Charts, A.2-101
Cognitive level: 3SPR 10CFR55.43 Ref: (4)
Source: New

The plant was in MODE 5. A fuel bundle was dropped into the core, which resulted in an off-site exposure consistent with a design basis Refueling Accident. The following conditions exist:

- Thyroid dose at the Site Area Boundary is 0.92R
- Whole Body dose at the Site Area Boundary is 0.92R
- Stack Effluent Monitor readings are 5.6 E6 µCi/sec
- RB Vent Effluent Monitor readings are 1.5 E6 µCi/sec

What would be the proper EAL declaration?

A. Unusual Event

B. Alert

C. Site Area Emergency

D. General Emergency

Answer: C is correct as the expected thyroid dose at the Site Area Boundary is 920mrem. RS1.2 is applicable, which states that Dose assessments using actual meteorology indicates doses greater than 100 mRem TEDE or 500 mRem thyroid CDE at or beyond the site boundary. Thus a SAE is the appropriate declaration to be made.

Distractors A, B, and D are plausible incorrect interpretations of the EAL flow chart, accumulated dose, or knowledge of this event.

2007 ILT NRC Exam Key
Question 81

Tier: 1 Group: 1
K/A: 295026 Suppression Pool High Water Temperature
EA2.02 3.9 SRO
Ability to determine and/or interpret the following as they apply to Suppression Pool High Water Temperature: Suppression pool level.
Reference: EOP –1000 Objective: M-8114L-005, 4
Reference provided during exam: None
Cognitive level: 1B 10CFR55.43 Ref: (5)
Source: New

For a given torus water temperature and RPV pressure, what is the explanation for having two torus water level conditions relative to the Heat Capacity Limit (Figure M)?

A. To describe the relationship between RPV pressure and torus water level to ensure sufficient heat capacity is available to accommodate emergency RPV depressurization with all available torus cooling in service.

B. To describe the trade-off between the ability of the torus water to absorb the energy of a blowdown, and the ability of the torus air space to stay within the pressure capacity when noncondensibles are added.

C. To describe the ability of various torus water levels to absorb the energy from the RPV in the event of a design based LOCA condition, and the ability of the torus air space to stay below the height of the drywell to torus vacuum breakers to prevent a negative pressure in the containment.

D. To describe the trade-off between the ability of the torus water to absorb the energy of load reject without bypass, and the ability of the torus air space to stay within the pressure capacity when noncondensibles are added.

Answer: B is correct as the two torus level limits resulted from a complex family of curves that defines the bounds which form describe the relationship between the ability of the torus water to absorb the energy of a blowdown, and the ability of the torus air space to stay within the pressure capacity when noncondensibles are added.
Distractors A, C, and D are plausible misinterpretations of this concept.

2007 ILT NRC Exam Key
Question 82

Tier: 1 Group: 1
K/A: 295028 High Drywell Temperature 2.1.19 3.0 SRO
Ability to use plant computer to obtain and evaluate parametric information on system or component status.
Reference: EOP-1000, SPDS Users Manual Objective: M-8114L-005, 4
Reference provided during exam: EOP Flow Charts
Cognitive level: 3SPR 10CFR55.43 Ref: (5)
Source: New

A plant transient was in progress. C.5-1100 and C.5-1200 have been entered and are being implemented.

Based on the below conditions which combination of parameters is consistent with the SPDS Containment Control display of the Drywell Spray OK tag having a WHITE border, and the CRS direction to spray the drywell?

	Drywell Temp.	Torus Water Level	Drywell Pressure
A.	450°F	3.7 feet	12 psig
B.	500°F	-3.3 feet	9.5 psig
C.	550°F	4.4 feet	12 psig
D.	600°F	-3.7 feet	11 psig

Answer: A is correct as a white border on this SPDS screen indicates that drywell spray is permitted due to both drywell temperature and pressure are within the spray limits per figure N, and torus water level is below the level of the vacuum breakers (4.3 feet).

Distractors B, C, and D provide incorrect knowledge of the SPDS parameter coding or misinterpretations from figure N, Drywell Spray Limit.

2007 ILT NRC Exam Key
Question 83

Tier: 1 Group: 2
K/A: 295014 Inadvertent Reactivity Addition AA2.01 4.2 SRO
Ability to determine and/or interpret the following as they apply to Inadvertent Reactivity Addition: Reactor power.
Reference: 4-AWI-04.01.05 / FP-OP-RM-01 Objective: M-8108L-031, 1
Reference provided during exam: 4-AWI-04.01.05 / FP-OP-RM-01
Cognitive level: 3SPR 10CFR55.43 Ref: (6)
Source: New

The control room was notified that for the past month the total feedwater flow input to computer point RPV 506 thermal power calculation was low by approximately 0.5 Mlbm/hr. During the past month calculated average daily thermal power was 1774.9 MWt.

As an SRO you have been selected to be a member of Reactivity Management Review Board (RMRB). What is the highest significance level that should be assigned to the above event?

A. Significance level 2

B. Significance level 3

C. Significance level 4

D. Significance level 5

Answer: A is correct as an unanticipated reactor power greater than the license limit of 1775 for 1 month would meet the criteria for significance level 2 as it is a reactivity management event that results in reactor operation outside of the design / licensing basis or a low probability, reactivity-related UFSAR event. These issues are usually reportable to external organizations.

Distractors B, C, and D are plausible misconceptions for interpreting the significance of this event.

2007 ILT NRC Exam Key
Question 84

Tier: 1 Group: 2
K/A: 295009 Low Reactor Water Level AA2.02 3.7 SRO
Ability to determine and/or interpret the following as they apply to Low Reactor Water Level: Steam flow / feed flow mismatch
Reference: C.4-B.06.05.A, C.4-F Objective: M-8114L-002, 1
Reference provided during exam: None
Cognitive level: 3SPK 10CFR55.43 Ref: (5)
Source: 2005 ILT NRC Exam, significantly modified

The reactor was at rated conditions when the 11 Reactor Feed Pump tripped. The following plant conditions are present:

- Steam flow indicates 4.1 Mlbm/hr and feed flow indicates 3.5 Mlbm/hr
- RPV water level is 15 inches and lowering

As the CRS, which of the following conditions would you use to determine that a manual scram would be inserted?

A. Prior to the transient, Xcel system condition ORANGE was in place.

B. Prior to the transient, both Feedwater Regulating Valves were locked up.

C. The Power to Flow Map indicates that the Buffer Region has been entered.

D. Reactor Feed pump suction pressure is 75 psig and slowly rising.

Answer: B. is correct as with feedwater flow less than steam flow, a positive indication that reactor water level will not turn is indicated. This steam flow corresponds to approximately 58% reactor power and is in the capacity of 1 RFP.

Distractor A is incorrect as this Xcel condition did not require a shutdown or reduced reactor power prior to the transient, it is merely a precautionary or informational condition.
Distractor C is incorrect as entering the Buffer region is expected under these conditions and does not warrant a manual scram to be initiated.
Distractor D is incorrect as this indication may demonstrate that the feed system is capable of turning RPV water level.

2007 ILT NRC Exam Key
Question 85

Tier: 1 Group: 2
K/A: 295033 2.4.29 4.0 SRO
Knowledge of the emergency plan.
Reference: A.2-101 Objective: M-8108L-039
Reference provided during exam: EAL Classification Chart
Cognitive level: 3SPR 10CFR55.43 Ref: (5)
Source: New

Given the following events:

- An un-isolable HPCI steam line break has occurred in the HPCI room
- A manual scram was inserted
- RPV water level is –127 inches and slowly lowering
- The CRS is waiting for a second area radiation to be above max safe to initiate a blowdown

What would be the proper EAL declaration?

A. Unusual Event per RU2.1

B. Alert per RA3.2 and/or FA1.1

C. Site Area Emergency per FS1.1

D. General Emergency per FG1.1

Answer: D is correct as a loss of ANY Two barriers and the potential loss of another exists (potential loss of Fuel Cladding Barrier due to RPV water level being less than –126 inches, loss of Reactor Coolant System barrier due to RPV water level being less than –126 inches, and loss of Primary Containment Barrier due to and un-isolable primary system leakage outside the drywell and any secondary containment area radiation GREATER THAN max safe).

Distractors A, B and D are incorrect as this these be a misinterpretation of the requirements for classifying this event or misinterpretation of the event classification parameters.

2007 ILT NRC Exam Key
Question 86

Tier: 2 Group: 1
K/A: 209001 Low Pressure Core Spray A2.09 3.3 SRO
Ability to (a) predict the impacts of the following on the Low Pressure Core Spray System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low suppression pool level.
Reference: C.5-1000, C.5-1200 Objective: M-8114L-005, 4
Reference provided during exam: EOP Flow Charts
Cognitive level: 3SPR 10CFR55.43 Ref: (5)
Source: New

Given the following:

- A LOCA is in progress
- All ECCS injection systems are injecting into the RPV at rated flow
- RPV water level is -120 inches and rising
- Torus water level is -3.5 feet and lowering slowly
- Torus water temperature is 150 °F and rising
- Drywell pressure is 12 psig and slowly rising

The BOP operator later reports that the 11 Core Spray loop injection is lower than expected. Which of the following is an explanation of this observation and what action should be directed?

A. The ECCS systems are operating in excess of the vortex limit, reduce total ECCS flow rate to <24,000 gpm.

B. The ECCS systems are operating in excess of the NPSH limits, reduce LPCI flow to 7000 gpm to restore NPSH conditions.

C. The 11 Core Spray pump is in excess of the NPSH limit, the Core Spray loop flow should be reduced to ≤ 2000 gpm.

D. The 11 Core Spray pump is operating in excess of the vortex limit, the Core Spray loop should be shutdown and NOT restarted until torus level can be raised.

Answer: A is correct as with all ECCS injection systems injecting into the RPV with torus water level at -3.5 feet, the ECCS pumps are operating below the vortex limit. This can noticeably reduce pump capacity. With RPV water level above TAF and rising, reducing total ECCS flow rate and/or raising torus water level would restore Core Spray to its normal flow rate.
Distractor B is concerned with NPSH / cavitation conditions, which are not the observed effect.
Distractor C is concerned with cavitation, which is not the observed effect and the parameters listed would not suggest this is a problem.
Distractor D takes actions which are not required and would not return the loop to normal flow rates.

2007 ILT NRC Exam Key
Question 87

Tier: 2 Group: 1 **[Question was deleted from Exam]**
K/A: 211000 Standby Liquid Control A2.08 4.2 SRO
Ability to (a) predict the impacts of the following on the Standby Liquid Control System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure to SCRAM.
Reference: B.03.05 Objective: M-8107L-004, 3
Reference provided during exam: EOP Flow Charts
Cognitive level: 3SPR 10CFR55.43 Ref: (5)
Source: New

During an ATWS event with SBLC injecting, the OATC reports SBLC tank level indicates 400 gallons. Predict the impact of this SBLC system condition on the plant and what actions you would direct as CRS associated with this SBLC condition?

A. The reactor cannot be determined to be shutdown under all conditions, refill the SBLC tank with boron solution.

B. Reactor depressurization can begin as Hot Shutdown Boron Weight has been achieved, secure the SBLC pump.

C. The reactor will remain shutdown under all conditions, secure the SBLC pump when level indicates 0 inches.

D. RPV water level must be retained between -126 inches and -33 inches until Cold Shutdown Boron Weight has been achieved, secure the SBLC pump when level indicates 0 inches.

Answer: C is correct as cold shutdown boron weight (CSBW) has been achieved and the SBLC pump is directed to be shutdown when tank level is 0.

Distractor A is incorrect as the action to refill the tank is not performed when injecting from the SBLC system (only via alternate methods).
Distractor B is incorrect as the SBLC pump should be left running to achieve CSBW.
Distractor D is incorrect as RPV water level may be raised when hot shutdown boron weight is achieved.

2007 ILT NRC Exam Key
Question 88

Tier: 2 Group: 1
K/A: 400000 Component Cooling Water 2.1.12 4.0 SRO
Ability to apply technical specifications for a system.
Reference: ITS sections 3.0, 3.7.2, 3.4.7 Objective: M-8108L-003, 4
Reference provided during exam: ITS sections 3.0, 3.7.2, 3.4.7
Cognitive level: 3SPR 10CFR55.43 Ref: (2)
Source: LOR Bank

The plant is operating in MODE 1 with no equipment inoperable. The 13 ESW pump is to be taken OOS for motor replacement.

Based on this situation, what plant equipment must be declared inoperable AND assuming a Safety Function Determination (SFDP) is satisfactorily performed, what ITS conditions and actions must be entered?

A. 1 subsystem of ESW and CRV, Div 1 LPCI and Div 1 Core Spray must be declared inoperable. LCO 3.7.2 Condition A, Required Action A.1 must be entered.

B. 1 subsystem of ESW and CRV, LCO 3.7.2 Condition A, Required Action A.1 must be entered.

C. 1 subsystem of ESW and CRV, Div 1 LPCI and Div 1 Core Spray must be declared inoperable. LCO 3.7.2 Condition A, Required Action A.1 and LCO 3.4.7 Condition A Required Action A.1 must be entered.

D. 1 subsystem of ESW must be declared inoperable only as LCO 3.0.6 relieves the requirement to cascade into declaring further systems inoperable.

Answer: A is correct as LCO 3.0.6 allows for the performance of a Safety Function Determination. The satisfactory completion of this determination results in not being required to perform the various actions of the affected support system when its LCO condition is not met, but does require acknowledgement of the inoperable status of the supported system when its support system is declared inoperable. As a result, LCO 3.7.2 Condition A, Required Action A.1 must be entered.

Distractors B, C, and D are plausible misconceptions of how this concept is implemented.

2007 ILT NRC Exam Key
Question 89

Tier: 2 Group: 1
K/A: 239002 Safety Relief Valves 2.4.30 3.6 SRO
Knowledge of which events related to system operations/status should be reported to outside agencies.
Reference: NUREG 1022, ITS section 3.4.3, Quad Cities LER, AWI-04.08.02
Objective: M-8108L-003, 4
Reference provided during exam: NUREG 1022, ITS section 3.4.3, AWI-04.08.02
Cognitive level: 3SPR 10CFR55.43 Ref: (2)
Source: New

The plant was operating in MODE 1 when a common mode failure was discovered to exist with a number of the Safety/Relief Valves. The extent of condition is being investigated.

What is the minimum number of SRVs, if at the time of discovery are to be inoperable, that would require a 4 hour non-emergency NRC notification?

A. Two

B. Three

C. Four

D. Five

Answer: C is correct as 7 of the 8 SRVs are required to be operable to meet the LCO. If 3 or more required SRVs are inoperable, then the plant must be in MODE 3 within 12 hours. Thus 4 SRVs would meet this requirement. This meets the criteria of 10CFR50.72(b)(2)(i), 4 hour notification for plant shutdown required by technical specifications.

Distractors A, B, and D are plausible misinterpretations of the ITS requirements and/or the notification requirements.

2007 ILT NRC Exam Key
Question 90

Tier: 2 Group: 1
K/A: 264000 Emergency Generators A2.01 3.6 SRO
Ability to (a) predict the impacts of the following on the Emergency Generators; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Parallel operation of emergency generator.
Reference: B.08.09 Objective: M-8107L-042, 7
Reference provided during exam: None
Cognitive level: 3SPK 10CFR55.43 Ref: (5)
Source: New

The plant is operating in MODE 1 with the 11 EDG synchronized to the grid to support post maintenance testing.

Predict the potential impact on the EDG if a failure of the grid would occur and what actions you as the CRS would direct.

A. The EDG could be overloaded and then overspeed when the output breaker opens. Direct that the overspeed trip be reset locally to allow restart of the EDG.

B. The EDG could be overloaded and then overspeed when the output breaker opens. Direct that the EDG local stop buttons be depressed to allow a fast start.

C. The EDG would not be available for an automatic quick start if the 15 bus experienced an under voltage condition. Direct the EDG be shutdown and the Fast Start Relay 95/7 for the 11 EDG be jumpered to allow a fast start.

D. The EDG would not be available for an automatic quick start if the 15 bus experienced an under voltage condition. Direct the EDG be shutdown locally to allow a fast start.

Answer: A is correct as when the EDG is operating in parallel with the electrical grid, it is considered to be inoperable. This is because the protective relaying is such that the EDG could be overloaded, then overspeed when the output breaker opens, if a failure of the grid occurred while the EDG was paralleled. The overspeed trip must be reset locally if tripped.

Distractors B, C, and D are plausible, but incorrect predictions and/or actions required to mitigate this event.

2007 ILT NRC Exam Key
Question 91

Tier: 2 Group: 2
K/A: 201001 CRDH A2.09 3.1 SRO
Ability to (a) predict the impacts of the following on the CRDH system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of applicable plant air systems.
Reference: C.4-B.08.04.01.A Objective: M-8114L-002, 1
Reference provided during exam: None
Cognitive level: 3SPK 10CFR55.43 Ref: (6)
Source: New

The plant is operating in MODE 1 when a loss of plant air occurs. The feed regulating valves have locked up. RPV water level is being maintained less than 40 inches. Annunciator 5-B-22 (SCRAM PILOT AIR HEADER HI/LO PRESS) has just alarmed.

Based on these plant conditions, what will be the impact on the control rod drive hydraulic system AND what actions, if any, should be directed to mitigate them?

A. An ATWS condition may occur due to hydraulic lock from the SDV. Entry into C.5-2007, FAILURE TO SCRAM, is required.

B. All control rods would fully insert as the backup scram valves open at this air pressure to prevent random rod insertion. Direct action to verify all rods inserted.

C. The CRD FCV fails OPEN resulting in excessive drive pressure and drifting control rods. Direct a manual scram to be inserted when the second rod begins to drift.

D. Uneven flux distribution could occur due to random rod insertion and the SDV function could be challenged. Direct a manual scram to be inserted at this time.

Answer: D is correct as when air pressure decreases to 60 psig the CRD HCU scram valves may begin to open, causing control rods to drift into the core. If the rods begin to drift, or alarm 5-B-22 is received, the operator should scram the reactor. The scram prevents uneven flux distribution from random control rod insertion and minimizes the challenges to the CRD system through flooding of the SDV.

Distractors A, B, and C are plausible misunderstandings of the relationship of loss of air and the impact on the CRDH system.

2007 ILT NRC Exam Key
Question 92

Tier: 2 Group: 2
K/A: 215001 Traversing In-Core Probe A2.08 2.9 SRO
Ability to (a) predict the impacts of the following on the Traversing In-Core Probe system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure to retract to shield.
Reference: B.05.03, C.4-B.04.01 Objective: M-8114L-002, 1
Reference provided during exam: None
Cognitive level: 3SPK 10CFR55.43 Ref: (5)
Source: New

The plant was operating in MODE 1 with OD-1 LPRM calibration in progress, when a plant transient occurred which resulted in the following:

- EOP-1100 and EOP-1200 have been entered due to a LOCA condition
- HPCI has automatically initiated
- ATCU-1 was beginning its run at the time of the transient
- ATCU-2 and 3 were at the indexer
- Stack WRGM indications are 5.01 E6uci/sec and rising

Based on these plant conditions, what will be the impact on the ATCU machines if the detector associated with ATCU-1 stuck inside the core and what action must be taken to correct, control or mitigate this condition?

A. ATCU -2 and 3 remain at the indexer. ATCU-1 must have its shear valve fired to ensure primary containment integrity. Power must be isolated to its ball valve to prevent inadvertent opening.

B. ATCU -2 and 3 retract to the shield. ATCU-1 must have its shear valve fired to ensure primary containment integrity.

C. ATCU -2 and 3 retract to the shield, ATCU-1 shear valve will automatically fire to ensure primary containment integrity. Power must be isolated to its ball valve to prevent inadvertent opening.

D. ATCU -2 and 3 remain at the indexer, ATCU-1 can be attempted to be manually retracted to the shield. If this is unsuccessful, its shear is required to be fired to ensure primary containment integrity.

Answer: B is correct as all TIP detectors should retract to their shield position upon a group 2 isolation signal which would be initiated by either low RPV water level or high D/W pressure at 2 psig due to the LOCA. Due to indications of fission product release, the stuck tip shear valve must be fired and all ball valve power supply breakers must be opened.
Distractors A, C, and D are plausible, but incorrect interpretations of the actions to be taken in this event.

2007 ILT NRC Exam Key
Question 93

Tier: 2 Group: 2
K/A: 272000 Radiation Monitoring System 2.2.11 3.4 SRO
Knowledge of the process for controlling temporary changes.
Reference: FP-G-DOC-4, QF-0013 Objective: M-8108L-039, 2
Reference provided during exam: Test 0289-A, FP-G-DOC-4, QF-0013, 4 AWI-02.02.02
Cognitive level: 3SPR 10CFR55.43 Ref: (3)
Source: New

During the performance of test 0289-A (SERVICE WATER EFFLUENT MONITOR FUNCTIONAL TEST) a change to the procedure is required to facilitate a modified meter RM-17-351. Specifically the change would modify Step 7b, Step 9b, and Step 11b criteria for recorder indications from ± 1/8 inch to ± 3/16 inch.

Can a Temporary Change be used in this case? Why or why not?

A. Yes, as there is no intent change.

B. Yes, with an approved 50.59 screening review.

C. No, as the acceptance criteria has been changed and is less conservative.

D. No, as all surveillance test procedure changes require either a Revision or Expedited Revision process be initiated.

Answer: C is correct as there is an intent change because the meter reading acceptance criteria has been changed.

Distractor A is incorrect as the acceptance criteria has been changed (* steps designate ODCM requirements, but do not indicate all acceptance criteria for test).
Distractor B is incorrect as the 50.59 applicability to determine screening is required and the temp change process cannot be used.
Distractor D is incorrect as this applies only if an intent change is determined.

2007 ILT NRC Exam Key
Question 94

Tier: 3
K/A: 2.1.4 3.4 SRO
Knowledge of shift staffing requirements
Reference: OWI-01.08 Objective: M-8108L-038, 2
Reference provided during exam: None
Cognitive level: 3SPK 10CFR55.43 Ref: (3)
Source: 2005 LOR Biennial Exam

You are the CRS with a NPE&RO holding an active license standing the OATC watch. He had previously stood 4 OATC watches and 4 as BOP this quarter. Today is 3/31/07. Due to his expertise, you have requested that he assist a newly qualified Reactor Side Operator with a backwash and precoat of a RWCU F/D.

Will he still be able to satisfy the requirements to maintain his license active? Why?

A. No, unless the assistance is less than 4 hours and participation in both turnovers is maintained as the OATC.

B. No, because it is required to stand five, 12 hour shifts per quarter as the OATC and being relieved to perform this assistance for any amount time would negate credit for this watch.

C. Yes, as long as the assistance only requires a relief of less than 1 hour and he returns to the OATC position.

D. Yes, as the requirement is to stand five, 12 hour shifts at either the OATC or BOP position.

Answer: C is correct as a minimum of five, 12 hour shifts are required. A NPE&RO must stand watch as the OATC to meet this requirement. The licensed operator filling the OATC position may temporarily be relieved of the Control Room panel monitoring requirements and still receive license maintenance credit as long as the duration of the relief is less than 1 hour.

Distractors A, B, and D do not meet these requirements.

2007 ILT NRC Exam Key
Question 95

Tier: 3
K/A: 2.2.25 3.7 SRO
Knowledge of the bases in technical specifications for limiting conditions for operations and safety limits.
Reference: ITS Objective: M-8108L-003, 2
Reference provided during exam: None
Cognitive level: 1B 10CFR55.43 Ref: (2)
Source: New

Which of the following describes the basis for allowing reactor operation in MODE 1 below 25% rated thermal power (RTP) without MCPR data?

A. The accuracy of the MCPR data is not adequate to support operability determinations below 25% (RTP). Maintaining BPWS will ensure margin to the MCPR LCO.

B. The IRMs provide rapid scram initiation for any significant power increase, which effectively eliminates any MCPR concerns below this power level.

C. Surveillance of thermal limits below 25% (RTP) is unnecessary due to the large inherent margin that ensures that the MCPR safety limit is not exceeded.

D. The Main Turbine Bypass Valves are available to negate any pressure induced power transients that would result in any MCPR LCO or safety limit violations below this power level.

Answer: C is correct as this statement is derived from the attached ITS bases for the MCPR LCO applicability.

Distractor A is incorrect as this is not the reason stated in the bases.
Distractor B is incorrect as the IRMs may be bypassed by the Mode Switch 00i. n this example.
Distractor D is incorrect as while plausible, does not account for all conditions that would lead to a challenge of the MCPR LCO or Safety Limit.

2007 ILT NRC Exam Key
Question 96

Tier: 3
K/A: 2.2.24 3.8 SRO
Ability to analyze the affect of maintenance activities on LCO status.
Reference: ITS 3.5.1, Example 1.3-2 Objective: M-8114L-002, 4
Reference provided during exam: ITS 3.5.1, ITS 1.3
Cognitive level: 3SPR 10CFR55.43 Ref: (2)
Source: Bank

The plant was operating at rated conditions when the following equipment became inoperable due to unscheduled maintenance:

- At 1300 on April 13, the 11 RHR pump was declared inoperable
- At 1700 on April 13, the 14 RHR pump was declared inoperable
- At 1700 on April 19, the 11 RHR pump was restored to operable status

As the CRS and including any extensions permitted when must the 14 RHR pump be restored without requiring a plant shutdown?

A. 1300 on May 13

B. 1700 on May 13

C. 1300 on May 14

D. 1700 on May 14

Answer: B is correct as the first inoperable component is restored to operable status first and the second inoperable component was concurrent with the first, a completion time extension can be applied. The 24 hour extension would not allow the 14 RHR pump to be extended longer than the actual allowed time for the 14 RHR pump, which is 30 days. Therefore, an extension of only 4 hours is allowed.

Distractors are plausible, but incorrect misinterpretations of the rule.

2007 ILT NRC Exam Key
Question 97

Tier: 3
K/A: 2.3.11 3.2 SRO
Ability to control radiation release.
Reference: EOP-1200, C.5-1-3505 Objective: M-8114L-011, 2
Reference provided during exam: EOP Flow Charts
Cognitive level: 3SPK 10CFR55.43 Ref: (4)
Source: New

A plant transient occurred with the following indications present 20 hours later:

- Drywell pressure is 52 psig and rising at the rate of 1 psig per 30 minutes
- Torus level is 15.2 feet
- Significant fuel damage is indicated

With regards to venting containment and the above plant conditions, which of the following would be a correct direction to provide the crew and why?

A. Line up via the hard pipe vent to prevent over pressurization of SBGT ducting.

B. Line up SBGT via the 2 inch vent from the torus to obtain the benefits of suppression pool scrubbing.

C. Vent the D/W until pressure reaches 10 psig to limit the number radioactive releases to the environment.

D. Vent the D/W and maintain pressure between 40 and 50 psig to maintain the containment below the D/W pressure limit.

Answer: D is correct as if the containment atmosphere may be contaminated, the volume released should generally be limited to that required to maintain primary containment pressure below the DW pressure limit. Venting via the hard pipe vent is not allowed at with torus water levels above 15 feet and venting through the torus is not allowed with torus water levels above 11.3 feet.

Distractors A, B, and C are plausible misconceptions of the ability to vent the primary containment under the plant conditions provided.

2007 ILT NRC Exam Key
Question 98

Tier: 3
K/A: 2.3.1 3.0 SRO
Knowledge of 10 CFR 20 and related facility radiation control requirements.
Reference: 4 AWI-08.04.01 Objective: M-8108L-002, 3
Reference provided during exam: None
Cognitive level: 1P 10CFR55.43 Ref: (5)
Source: New

You are the CRS on a crew, which contains a female out plant operator. She declared her pregnancy during her 6^{th} month of gestation. Her TEDE exposure was determined to be 460 mrem for the 6 month period.

What are the administrative limits for the remainder of her pregnancy?

A. She cannot receive any further exposure.

B. She may receive up to 50 mrem for the remainder of the pregnancy.

C. She may receive up to 50 mrem per month for the remainder of the pregnancy.

D. She may receive up to 500 mrem for the remainder of the pregnancy.

Answer: B is correct as declared pregnant worker shall exceed 450 mrem TEDE during the entire gestation period OR 50 mrem for the remainder of the pregnancy if 450 mrem TEDE has been exceeded at the time of the declaration.

Distractors A, C, and D are plausible misconceptions of the exposure limits for a declared pregnant female employee.

2007 ILT NRC Exam Key
Question 99

Tier: 3 K/A: 2.4.14 3.9 SRO
Knowledge of general guidelines for EOP flowchart use.
Reference: C.5.1-1000, C.5.1-1200 Objective: M-8114L-005, 4
Reference provided during exam: EOP Flow charts
Cognitive level: 3SPR 10CFR55.43 Ref: (5)
Source: 2005 ILT NRC Exam

A Loss of Coolant Accident has occurred and the following conditions are present:

- Drywell pressure is 32 psig and rising
- Drywell Temperature is 282°F and rising
- RPV pressure is 800 psig and lowering
- RPV water level is -50 inches and rising
- Torus water level is 2 feet and rising
- 16 Bus is locked out
- RHR is lined up for LPCI injection
- The Drywell Cooling Fan switches are in OFF
- The Recirc Pumps are tripped

As the CRS, which of the following is the NEXT action to be directed based on the above information?

A. Lower Torus level

B. Initiate Drywell Sprays

C. Initiate a Blowdown due to exceeding 281°F in the Drywell

D. Initiate a Blowdown due to exceeding Pressure Suppression Pressure

Answer: B is correct as initial operator actions must be taken to place drywell sprays in service, Torus sprays may already be in service, the decision as to whether or not conditions can stay within the PSP or D/W temp can be restored should not be made until drywell sprays are placed in service and an evaluation can be made as to the expected response.

Distractor A is incorrect as the flow chart steps must be prioritized and torus level can only be lowered with “B” loop of RHR and the 16 bus lockout will prevent this.
Distractor C is incorrect as the ability to restore and maintain cannot be evaluated prior to initiating sprays
Distractor D is incorrect as the ability to maintain below the limit cannot be evaluated prior to initiating sprays

2007 ILT NRC Exam Key
Question 100

Tier: 3
K/A: 2.4.44 4.0 SRO
Knowledge of emergency plan protective action requirements.
Reference: A.2-204 Objective: M-8108L-039
Reference provided during exam: None
Cognitive level: 1P
Source: 2005 Audit Exam

What Protective Action Recommendation (PAR) is made INITIALLY upon the declaration of a General Emergency?

A. Shelter or evacuate a 2 mile radius and 5 miles down wind and advise the remainder of the plume EPZ to go indoors to monitor EAS broadcasts.

B. Shelter or evacuate a 2 mile radius and 10 miles down wind and advise the remainder of the plume EPZ to go indoors to monitor EAS broadcasts.

C. After an initial dose projection is obtained, shelter or evacuate a 2 mile radius and 5 miles down wind and advise the remainder of the plume EPZ to go indoors to monitor EAS broadcasts.

D. No protective action recommendation is appropriate when projected plume dose rates do NOT exceed 1000 mrem (TEDE) or 5000 mrem (CDE) thyroid dose.

Answer: A. is correct as the initial PARs for a G.E. is Shelter or evacuate a 2 mile radius and 5 miles down wind and advise the remainder of the plume EPZ to go indoors to monitor EAS broadcasts.

Distractor B is incorrect as 10 miles are not initial PARs distances.
Distractor C is incorrect as initial PARs is made before any dose projections are made.
Distractor D is incorrect as initially the 2 mile/5 mile recommendation is always made.

MONTICELLO February 2007 NRC ILT Written Examination Answer Key

- **Questions 1 through 75 are RO level questions.**
- **Questions 76 through 100 are SRO level questions.**

Q#	Answer	Q#	Answer	Q#	Answer	Q#	Answer
1	B	26	A	51	D	76	A
2	C	27	A	52	B	77	D
3	C	28	A	53	C	78	C
4	D	29	D	54	D	79	C
5	D	30	B	55	A	80	C
6	D	31	C	56	B	81	B
7	C	32	D	57	D	82	A
8	B	33	A	58	B	83	A
9	C	34	C	59	C	84	B
10	A	35	C	60	D	85	D
11	D	36	B	61	A	86	A
12	B	37	B	62	C	87	Deleted
13	C	38	A	63	C	88	A
14	C	39	C	64	C	89	C
15	B	40	C	65	D	90	A
16	C	41	D	66	C	91	D
17	C	42	C	67	C	92	B
18	A	43	C	68	A	93	C
19	A	44	C	69	C	94	C
20	A and D	45	D	70	Deleted	95	C
21	A	46	D	71	B	96	B
22	B	47	C	72	B	97	D
23	B	48	C	73	D	98	B
24	B	49	A	74	A	99	B
25	B	50	D	75	D	100	A