

Facility: MNGP				Date of Exam: 10/05/2007														
Tier	Group	RO K/A Category Points											SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A 2	G *	Total		
1. Emergency & Abnormal Plant Evolutions	1				N/A					N/A			20	4	3	7		
	2												7	2	1	3		
	Tier Totals												27	6	4	10		
2. Plant Systems	1												26	3	2	5		
	2												12	2	1	3		
	Tier Totals												38	5	3	8		
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
										2	2			2	1			

- Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- 7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401		BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)										
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4										
295003 Partial or Complete Loss of AC / 6										
295004 Partial or Total Loss of DC Pwr / 6										
295005 Main Turbine Generator Trip / 3										
295006 SCRAM / 1										
295016 Control Room Abandonment / 7						X	2.2.9 Knowledge of the process for determining if the proposed change / test or experiment increases the probability of occurrence or consequences of an accident during the change / test or experiment.	3.3	1	
295018 Partial or Total Loss of CCW / 8										
295019 Partial or Total Loss of Inst. Air / 8					X		AA2.01 Instrument air system pressure	3.6	1	
295021 Loss of Shutdown Cooling / 4										
295023 Refueling Acc / 8										
295024 High Drywell Pressure / 5					X		EA2.04 Suppression chamber pressure	3.9	1	
295025 High Reactor Pressure / 3						X	2.3.4 Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized.	3.1	1	
295026 Suppression Pool High Water Temp. / 5										
295027 High Containment Temperature / 5							N/A MNGP	N/A	N/A	
295028 High Drywell Temperature / 5										
295030 Low Suppression Pool Wtr Lvl / 5										
295031 Reactor Low Water Level / 2					X		EA2.04 Adequate core cooling	4.8	1	
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1					X		EA2.06 Reactor pressure	4.1	1	
295038 High Off-site Release Rate / 9										
600000 Plant Fire On Site / 8						X	2.4.29 Knowledge of the emergency plan	4.0	1	
K/A Category Totals:	0	0	0	0	4	3	Group Point Total:		7	

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5							N/A MNGP	N/A	N/A
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1					X		AA2.02 Reactor period	3.9	1
295015 Incomplete SCRAM / 1									
295017 High Off-site Release Rate / 9					X		AA2.05 Meteorological data	3.8	1
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5									
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5						X	2.4.11 Knowledge of abnormal condition procedures	3.6	1
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:	0	0	0	0	2	1	Group Point Total:		3

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode														
205000 Shutdown Cooling														
206000 HPCI														
207000 Isolation (Emergency) Condenser												N/A MNGP	N/A	N/A
209001 LPCS														
209002 HPCS												N/A MNGP	N/A	N/A
211000 SLC														
212000 RPS								X				A2.16 Changing mode switch position	4.1	1
215003 IRM														
215004 Source Range Monitor											X	2.2.26 Knowledge of refueling administrative requirements.	3.7	1
215005 APRM / LPRM														
217000 RCIC														
218000 ADS														
223002 PCIS/Nuclear Steam Supply Shutoff														
239002 SRVs								X				A2.02 Leaky SRV	3.2	1
259002 Reactor Water Level Control														
261000 SGTS														
262001 AC Electrical Distribution														
262002 UPS (AC/DC)								X				A2.01 Under voltage	2.8	1
263000 DC Electrical Distribution														
264000 EDGs											X	2.4.22 Knowledge of the basis for prioritizing safety functions during abnormal/emergency operations.	4.0	1
300000 Instrument Air														
400000 Component Cooling Water														
K/A Category Point Totals:	0	0	0	0	0	0	0	3	0	0	2	Group Point Total		5

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic														
201002 RMCS											X	2.2.12 Knowledge of surveillance procedures	3.4	1
201003 Control Rod and Drive Mechanism														
201004 RSCS												N/A MNGP	N/A	N/A
201005 RCIS												N/A MNGP	N/A	N/A
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control								X				A2.02 Loss of A.C	3.0	1
204000 RWCU														
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM														
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control												N/A MNGP	N/A	N/A
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux.														
256000 Reactor Condensate														
259001 Reactor Feedwater								X				A2.07 Reactor water level control system malfunctions.	3.8	1
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring														
286000 Fire Protection														

ES-401

BWR Examination Outline

Form ES-401-1

Plant Systems - Tier 2/Group 2 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC														
290002 Reactor Vessel Internals														
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	1	Group Point Total		3

Facility: MNGP		Date of Exam: 10/05/2007				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.25	Ability to obtain and interpret station reference materials such as graphs / monographs / and tables which contain performance data			3.1	1
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.			4.0	1
	Subtotal					2
2. Equipment Control	2.2.22	Knowledge of limiting conditions for operations and safety limits			4.1	1
	2.2.13	Knowledge of tagging and clearance procedures			3.8	1
	Subtotal					2
3. Radiation Control	2.3.2	Knowledge of facility ALARA program			2.9	1
	2.3.9	Knowledge of the process for performing a containment purge			3.4	1
	Subtotal					2
4. Emergency Procedures / Plan	2.4.6	Knowledge of symptom based EOP mitigation strategies			4.0	1
	Subtotal					1
Tier 3 Point Total						7

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 1

Tier: 1

Group: 1

K/A: 295016 Control Room Abandonment 2.2.9 3.3 SRO

Knowledge of the process for determining if the proposed change / test or experiment increases the probability of occurrence or consequence of an accident during the change / test or experiment.

Reference: 4AWI-02.02.02

LP Objective: M8108L-039, 1.c

Reference provided during exam: None

Cognitive level: 1F

Difficulty: 2

10CFR55.43(b) Ref: (3)

Source: New

Which of the following procedures would require a 10CFR50.59 screening if it were significantly revised?

- A. D.2-05.E.1 (RAISING A FUEL ASSEMBLY)
- B. 4211-PM (CORE SPRAY PUMP MOTOR 11)
- C. A.2-101 (CLASSIFICATION OF EMERGENCIES)
- D. C.4-C (SHUTDOWN OUTSIDE CONTROL ROOM)

Answer: **D** is correct. C.4-C is required to have a 50.59 screening for significant revisions.

Distracter A is incorrect. D manuals not required.

Distracter B is incorrect. PMs not required.

Distracter D is incorrect. A manual not required.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 2

Tier: 1

Group: 1

K/A: 295003 Partial or Complete Loss of AC AA2.04 3.7 SRO
Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: System Lineups

Reference: B.09.07-02

LP Objective: M8107L-040, 4 & 9

Reference provided during exam: None

Cognitive level: 3SPK

Difficulty: 3

10CFR55.43(b) Ref: (5)

Source: New

The plant is operating at rated conditions with 11Core Spray pump isolated for maintenance. A Station Blackout occurs concurrent with a LOCA. Plant conditions are as follows:

- RPV pressure is 300 psig and lowering 10 psig/minute
- RPV water level is – 80" inches and lowering 5 inches/minute
- Drywell pressure is 9 psig and rising 0.2 psig/minute
- Drywell temperature is 260°F and rising 1°F/minute

Ten minutes later 15 Bus is reenergized from #11 EDG. Which of the following should be directed FIRST?

- A. C.5-3502, (CONTAINMENT SPRAY).
- B. C.4-H, (RESTORATION OF PLANT LOADS)
- C. C.5-3503, (DEFEAT DRYWELL COOLER TRIPS).
- D. B.09.07-05.E.7, (TRANSFER OF LPCI SWING BUS FROM ALTERNATE TO NORMAL SOURCE).

Answer: D is correct. For the given conditions, HPCI & RCIC cannot maintain RPV level. After 10 minutes elapses, RPV water level will be –130 inches, which is below TAF. The SBO caused the swing bus to transfer to its alternate source, which will have to be manually transferred back to restore power to the LPCI injection valves so RHR can inject to the vessel and avoid an emergency depressurization.

Distracter A is incorrect. Drywell pressure will be 11 psig which requires action but is not priority over restoring RPV water level.

Distracter B is incorrect. This is a required action but is not priority over restoring RPV water level.

Distracter C is incorrect. This action may be performed after C.4-H has restored RBCCW but is not priority over restoring RPV water level.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 3

Tier: 1

Group: 1

K/A: 295024 High Drywell Pressure EA2.04 3.9 SRO

Ability to determine and/or interpret the following as they apply to HIGH

DRYWELL PRESSURE: Suppression chamber pressure

Reference: C.5-1200, B.04.01.01-02

LP Objective: M8114L-005, 2.b

Reference provided during exam: EOP Flow Charts

Cognitive level: 3SPK/SPR **Difficulty:** 3 **10CFR55.43(b) Ref:** (5)

Source: New

The plant was operating at rated conditions when an inadvertent Group I Isolation occurred. While taking actions for the scram the crew notices all suppression chamber to drywell vacuum breakers are cycling open when a SRV opens. The following conditions are now present:

- Torus spray is OFF
- Torus pressure is 6 psig
- Drywell cooling fans are OFF
- Drywell temperature is 250°F

For the given conditions, can you direct the initiation of Drywell Sprays from the temperature leg of C.5-1200 and why?

- A. No, torus sprays must be placed in service prior to initiation of drywell sprays
- B. No, under current plant conditions drywell pressure is less than torus pressure.
- C. No, both recirc pumps are running and must be tripped prior to initiating drywell sprays.
- D. Yes, drywell temperature is approaching 281°F and all conditions are met to initiate sprays.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Answer: B is correct. Indications exist for a SRV tailpipe break above the waterline in the torus. Candidate must interpret from torus pressure what DW pressure is currently at. With a tail pipe break in the torus, torus pressure will rise faster than DW pressure due to the pressure relief vacuum breakers, which begin to open at .25 psid and are full open at .50 psid. This will cause torus pressure to be .25 to .50 psig higher than drywell pressure. When potting the given conditions of DW temperature and torus pressure plus .25 psig, the Do Not Spray portion of EOP Figure N is entered.

Distracter A is incorrect. When proceeding down the Drywell temperature leg torus sprays are not required to be placed in service prior to drywell sprays.

Distracter C is incorrect. Recirc pumps would have automatically tripped due to a LPCI initiation signal at a drywell pressure of 2 psig

Distracter D is incorrect. 281°F is being approached but EOP Figure N is not met.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 4

Tier: 1

Group: 1

K/A: 295025

High Reactor Pressure

2.3.4

3.1 SRO

Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized

Reference: A.2-401

LP Objective: M7406L-002, 9

Reference provided during exam: None

Cognitive level: 1F

Difficulty: 2

10CFR55.43(b) Ref: (4)(5)

Source: New

An event has occurred that has resulted in the Reactor Vessel Safety Pressure Limit being exceeded. A Site Area Emergency has been declared. It has been determined that an operator is required to enter the reactor building and manipulate a number of valves to protect valuable property.

As Emergency Director, which of the following is the Emergency Plan exposure limit that you can authorize for this activity?

- A. 5 REM
- B. 10 REM
- C. 15 REM
- D. 25 REM

Answer: B is correct. IAW Figure 7.1, 10 REM is allowed for protection of valuable property. The ED has the authority to authorize all emergency exposure.

Distractor A: Incorrect as this is the allowable limit for all emergency activities.

Distractor C: Incorrect as this is the 10CFR limit for dose equivalent to the lens

Distractor D: Incorrect as this is the limit for life saving or protection to large populations.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 5

Tier: 1

Group: 1

K/A: 295031 Reactor Low Water Level EA2.04 4.8 SRO

Ability to determine and/or interpret the following as they apply to REACTOR

LOW WATER LEVEL: Adequate core cooling

Reference: C.5.1-1000, C.5-1100, C.5-2002 and C.5-2007

LP Objective: M8114L-005, 2, 3

Reference provided during exam: EOP flowcharts

Cognitive level: 3 SPR **Difficulty:** 2 **10CFR55.43(b) Ref:** (5)

Source: New

Which of the following conditions would NOT ensure Adequate Core Cooling?

	<u>Reactor Power</u>	<u>Blowdown in-progress</u>	<u>RPV Water Level</u>	<u>RPV Pressure</u>
A.	18%	NO	- 145"	820 psig
B.	11%	YES	- 161"	306 psig
C.	2%	YES	- 155"	128 psig
D.	0%	YES	- 138"	70 psig

Answer: C is correct. With a ATWS blowdown in progress and level < -149" reactor pressure must stay above 266 psig to assure adequate core cooling.

Distracter A is incorrect. RPV water level > -149" during an ATWS with no ED in progress will provide adequate core cooling.

Distracter B is incorrect. With a ATWS blowdown in progress and level < -149" reactor pressure is above 266 psig which assures adequate core cooling.

Distracter D is incorrect. RPV water level > -149" during NON-ATWS with ED in progress will provide adequate core cooling down to a reactor pressure of 50psig which is the SRV minimum opening pressure.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 6

Tier: 1

Group: 1

K/A: 295037 SCRAM Condition Present and Power Above APRM

Downscale or Unknown EA2.06 4.1 SRO

*Ability to determine and/or interpret the following as they apply to SCRAM
CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE
OR UNKNOWN: Reactor pressure*

Reference: C.5.1-2007 and C.5-2007

LP Objective: M8114L-005, 2, 3

Reference provided during exam: EOP flowcharts

Cognitive level: 3SPK/SPR **Difficulty:** 2 **10CFR55.43(b) Ref:** (5)

Source: 2007 NRC - Significantly Modified (New stem condition & new distracter)

The plant was operating at 95% power when a 2R Lockout resulted in an ATWS event. Ten minutes following the event the following conditions exist:

- Bus 15 is locked out, all other buses are energized from 1R
- Reactor power is 15% and slowly lowering
- SBLC is injecting, tank level is 1300 gallons and lowering
- RPV water level is –80 inches and difficult to control
- H SRV remains full open and G SRV is cycling open and closed

As the CRS, which of the following must be directed to the Balance of Plant operator?

- A. Allow LO-LO SET to remain cycling
- B. Stabilize RPV pressure 800-1000 psig using SRVs
- C. Open additional SRVs to lower RPV pressure to 930 psig
- D. Stabilize RPV pressure below 1056 psig using main turbine bypass valves

Answer: C is correct. H SRV cycles between 972-1052 psig, G SRV cycles between 982-1062 psig. Enough power is being generated to keep H SRV open therefore pressure is only cycling at the G SRV setpoint. Additionally, RPV water level difficult to control the CRS should prioritize lowering pressure to 930 psig due to rapid SRV cycling.

Distracter A is incorrect. Lo Lo Set is functioning properly. However, rapid cycling is occurring due to the indication that level is difficult to control. Pressure is required to be reduced to 930psig, as “yes” has to be answered when addressing the question in the triangle of C.5-2007 pressure leg “Rapid SRV Cycling?”

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Distracter B is incorrect. This is considered rapid SRV cycling and 800-1000 psig can only be directed after reactor pressure is lowered to less than 930psig.

Distracter D is incorrect as the bypass valves would not be available due to the Bus 15 lockout and loss of the Turbine Aux Oil pump.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 7

Tier: 1

Group: 1

K/A: 600000

Plant Fire On Site

2.4.29

4.0 SRO

Knowledge of the emergency plan

Reference: 4AWI-08.02.02, A.2-101

LP Objective: M8108L-039, 2 and M7406-002, 2, 3

Reference provided during exam: EAL Matrix

Cognitive level: 3SPR

Difficulty: 2

10CFR55.43(b) Ref: (5)

Source: New

The plant was operating at rated conditions when control room receives a report of a fire in the Heating Boiler Room. Given the following timeline:

00:00:00 Fire reported to control room

00:08:00 Fire Brigade began attacking the fire

00:16:00 Control Room notified the fire is extinguished

Determine if Emergency Plan classification is required and, if so, who would fulfill the responsibilities of the Shift Emergency Communicator (SEC)?

Emergency Plan classification ...

- A. is NOT required
- B. Is required, Shift Security Supervisor
- C. Is required, Shift Chemistry Technician
- D. Is required, Shift Radiation Protection Technician

Answer: B is correct. Monticello has three qualified SECs on shift. In the case of a fire, the shift chemist and shift HP are required to report as part of the fire brigade resulting in the security shift supervisor as the only available SEC.

Distracter A is incorrect. IAW HU2.1 a fire has been burning for 15 minutes in an area contiguous to the administration area. This is a recent change to Monticello's EALs. Previously, the clock did not start until the fire brigade arrived at the scene and began to attack the fire. If the candidate applies the old time requirement an NUE would not be declared for the given conditions/timeline.

Distracter C is incorrect. Although the Shift CT is qualified SEC they must report as a fire brigade member.

Distracter D is incorrect. Although the Shift RPT is qualified SEC they must report as a fire brigade member.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 8

Tier: 1

Group: 2

K/A: 295014 Inadvertent Reactivity Addition AA2.02 SRO 3.9

*Ability to determine and/or interpret the following as they apply to
INADVERTENT REACTIVITY ADDITION: Reactor period*

Reference: C.6-005-A-20, C.1

LP Objective: M8107L-054, 7 and M8113L-001, 2, 9

Reference provided during exam: None

Cognitive level: 1P

Difficulty: 3

10CFR55.43(b) Ref: (5)

Source: New

A plant startup is being performed with a rod withdrawal currently in progress. The OATC completes withdrawal of the selected control rod and the following occurs:

00:00:00	IRMs indicate 10 on Range 3
00:00:08	Reactor power has doubled
00:00:10	The OATC inserts the selected control rod
00:00:13	The OATC completes insertion of the selected control rod
00:00:42	Reactor power has doubled again

As the CRS, you are required to direct the OATC to insert control rods...

- A. and establish a 60-100 second period IAW C.1 (Reactor Startup).
- B. to bring the reactor subcritical until the Nuclear Engineer completes an evaluation and notify personnel IAW 4AWI-04.08.01 (Event Notifications).
- C. to bring the reactor subcritical until the Nuclear Engineer completes an evaluation, then reestablish a 60-100 second period IAW C.1 (Reactor Startup).
- D. to bring the reactor subcritical until the Nuclear Engineer completes an evaluation, then with permission from the Operations Manager continue the startup IAW C.1 (Reactor Startup). .

Answer: B is correct. This power rise will result in a 11.5 second period resulting in a short period alarm. If this alarm is received rods should be inserted to bring the reactor subcritical, Technical Staff (Nuclear Engineering) should evaluate and personnel should be notified IAW Event Notifications

Distracter A is incorrect. The reactor must be brought subcritical

Distracter C is incorrect. Event Notifications must be made.

Distracter D is incorrect. Event Notifications must be made and Plant manager permission is required

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 9

Tier: 1

Group: 2

K/A: 295017

High Off-site Release rate

AA2.05

SRO 3.8

Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Metrological data

Reference: A.2-204, 5790-102-02

LP Objective: M7406L-002, 3

Reference provided during exam: 5790-102-02 pg. 2 of 3

Cognitive level: 3SPR

Difficulty: 2

10CFR55.43(b) Ref: (4)

Source: New

An event has occurred that has resulted in the following conditions:

- General Emergency has been declared
- A Radioactive release is in progress
- The MET tower is out of service
- Field teams report wind directly from the West
- Severe weather is NOT predicted in the forecast

For the above conditions, determine wind direction and the initial Protective Action Recommendations?

Wind direction from (1) degrees.

Evacuate (2) sectors out to 2 miles.

Evacuate (3) sectors out to 5 miles

Evacuate (4) sectors out to 10 miles.

	(1) <u>Wind From</u>	(2) <u>2 miles</u>	(3) <u>5 miles</u>	(4) <u>10 miles</u>
A.	270	D, E, F	5N, 5E, 5S	10E, 10SE
B.	90	M, N, P	5W	10SW, 10W, 10NW
C.	90	All	5W	None
D.	270	All	5N, 5E, 5S	None

Answer: D is correct. Wind is from 270°. This will require all sectors within 2 miles evacuated and the 5N, 5E, 5S sectors evacuated. The 10-mile sectors are based on dose projection and are only evacuated with state recommendation.

Distracter A is incorrect. All 2-mile sectors should be evacuated and 10-mile evacuation not required

Distracter B is incorrect. 10-mile evacuation not required

Distracter C is incorrect. This would be correct if 90° used for wind direction

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 10

Tier: 1

Group: 2

K/A: 295034

High Secondary Containment Area Radiation Levels 2.4.11
Knowledge of abnormal condition procedures SRO 3.6

Reference: D.2-05, page 6 paragraph 11)

LP Objective: M8107L-019, 6.d & 7.c

Reference provided during exam: EOP flowcharts and EAL Matrix

Cognitive level: 1 P

Difficulty: 3

10CFR55.43(b) Ref: (7)

Source: New

The plant is operating at rated conditions with a fuel bundle currently being shuffled in the Spent Fuel Pool. While the fuel bundle is being moved radiation levels change and are now as follows:

- Area Radiation Monitor A-1 reads 27 mrem/hr
- Area Radiation Monitor A-2 reads 22 mrem/hr
- Area Radiation Monitor A-3 reads 11 mrem/hr
- RM-17-453A (FUEL POOL MONITOR CHANNEL A) reads 22 mrem/hr
- RM-17-453B (FUEL POOL MONITOR CHANNEL B) reads 28 mrem/hr

As the CRS, which of the following meets the requirements for the above conditions?

- A. Declare an NUE
- B. Evacuate the Reactor Building
- C. Verify Standby Gas Treatment System is operating
- D. Continue with the fuel shuffle, radiation levels are normal for this evolution

Answer: B is correct. IAW D.2-05 General Rules and Precautions for abnormal radiation levels: "If a high radiation alarm or a high airborne radiation alarm is sounded, all personnel in the Reactor Building will leave at once." {SRO Candidate must evaluate EALs to determine A-1 is in alarm (alarm setpoint 20 mrem/hr).}

Distracter A is incorrect. With A-1 in alarm this would be classified as an Alert. Distracter C is incorrect. This action is directed by EOPs if RB exhaust plenum radiation is above 26 mrem/hr.

Distracter D is incorrect. IAW D.2-05 any fuel bundle being moved would be stowed and the Reactor building would be evacuated.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 11

Tier: 2

Group: 1

K/A: 212000

RPS

A2.16

4.1 SRO

Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

Changing mode switch position

Reference: B.05.01.02, TS 3.0, 3.3.1.1

LP Objective: M8107L-069, 10.c, d

Reference provided during exam: TS 3.0, 3.3.1.1

Cognitive level: 3SPR

Difficulty: 4

10CFR55.43(b) Ref: (2)

Source: New

A reactor startup is in progress when a complete loss of Y-50 (RPS Bus A) occurs. Given the following:

- Reactor power is 4%
- The Mode Switch is in START TO HOT STANDBY
- APRM's 1 & 6 are currently bypassed
- Bypassed LPRMs are circled on the given LPRM assignment matrix (see photo on next page)

What action, if any, is required to be taken prior to placing the Mode Switch in RUN?

- A. Bypass APRM #4
- B. Bypass APRM #5
- C. No action required; APRM #6 is already bypassed
- D. No action required; LCO 3.0.4 applies allowing a mode change for this condition

Answer: B is correct. A loss of Y-50 would result in a loss of APRMs 1,2 and 3 and APRM G2 Page. This condition requires 2 operable APRMs on B RPS prior to transferring the mode switch to run. For an APRM to be considered operable it must have 14 LPRMs and two of each level per channel; except APRM 1, 2, 5, and 6 can lose all of their shared LPRMs plus one. With current conditions only APRM 4 is operable as APRM 6 is bypassed and APRM 5 only has one C level LPRM. APRM 5 must be bypassed and APRM 6 unbypassed to restore RPS Bus "B" APRM monitoring to an operable status.

Distracter A is incorrect. This would leave one operable APRM.

Distracters C and D are incorrect. APRM 5 must be bypassed

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

0 = BYPASSED

LPRM ASSIGNMENT MATRIX

<u>LPRM</u>	<u>LPRM</u> <u>GRP 1</u>	<u>LPRM</u> <u>GRP 2</u>	<u>APRM</u> <u>CH 1</u>	<u>APRM</u> <u>CH 2</u>	<u>APRM</u> <u>CH 3</u>	<u>APRM</u> <u>CH 4</u>	<u>APRM</u> <u>CH 5</u>	<u>APRM</u> <u>CH 6</u>
04-29		3C				3D	3A	3B
12-13	4C		4D	4A	4B	4C	4D	4A
12-21		4B						
12-29	2A		2B	2C	2D			
12-37		2D				2A	2B	2C
20-13		5C				5D	5A	5B
20-21	4D		4A	4B	4C			
20-29		3A				3B	3C	3D
20-37	2B		2C	2D	2A			
20-45		1C				1D	1A	1B
28-05		6B				6C	6D	6A
28-13	4A		4B	4C	4D			
28-21		4D				4A	4B	4C
28-29	3C		3D	3A	3B			
28-37		3B				3C	3D	3A
28-45	1A		1B	1C	1D			
36-13		6A				6B	6C	6D
36-21	5B		5C	5D	5A			
36-29		4C				4D	4A	4B
36-37	3D		3A	3B	3C			
36-45		2A				2B	2C	2D
44-21		5B				5C	5D	5A
44-29	3A		3B	3C	3D			
44-37		3D				3A	3B	3C

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 12

Tier: 2

Group 1

K/A: 215004

Source Range Monitor

2.2.26

3.7 SRO

Knowledge of refueling administrative requirements

Reference: D.2-05

LP Objective: M8107L-019, 7

Reference provided during exam: None

Cognitive level: 1P

Difficulty: 3

10CFR55.43(b) Ref: (6)(7)

Source: New

The plant is in Mode 5 with movement of irradiated fuel in progress. A change to the Refueling procedure (Verification Checklist Data File and Fuel Handling Supervisor Verification Checklist) has been requested. The in-core location of a fuel bundle will be changed to prevent SRM count rate from lowering below 10 CPS.

Which of the following meets the required signatures for this change?

- A. Control Room Supervisor AND Shift Manager
- B. Fuel Handling Supervisor AND Nuclear Engineer
- C. Control Room Supervisor, Shift Manager AND Nuclear Engineer
- D. Fuel Handling Supervisor, Control Room Supervisor AND Operations Manager

Answer: C is correct. Procedural changes may be made with the concurrence and signatures of two people if the intent of the procedure is NOT changed. One approval SHALL be the duty Shift Supervisor, duty Shift Manager, or a duty SRO licensed individual assigned to perform the duties of the Shift Supervisor for a specific activity (i.e. the Fuel handling Supervisor). The second approval SHALL be by a site NSP supervisor (including Shift Supervisors and Shift Managers) or higher level of management knowledgeable of the procedure being changed and the reason for the change. If the change affects the in-core location of a component, one nuclear engineer signature is also needed.

Distracter A and B are incorrect. Three signatures are required.

Distracter D is incorrect. Must have Nuclear Engineer signature.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 13

Tier: 2

Group: 1

K/A: 239002

SRVs

A2.02

SRO 3.2

Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Leaky SRV

Reference: C.4-B.03.03.B, TS 3.4.3 & 3.5.1

LP Objective: M8114L-002, 2

Reference provided during exam: TS 3.4.3 & 3.5.1

Cognitive level: 3SPR **Difficulty:** 3 **10CFR55.43(b) Ref:** (2)(5)

Source: New

The plant is operating at rated conditions. The previous shift performed routine maintenance on HPCI (See photo on next page for HPCI system status). The following event occurs:

- SRV H tailpipe is reading 140°F and rising 1°F/hr
- SRV H "Amber" light is OFF

As the CRS, if these conditions continue, which of the following must be directed if SRV H tailpipe temperature exceeds 210°F?

- A. Place DIV I Core Spray in Torus Mixing Mode and restore Core Spray to operable status within 72 hours
- B. Place DIV I Torus Cooling in service and restore RHR/LPCI mode to operable status within 72 hours
- C. Reduce Reactor power IAW C.4-F (Rapid Power Reduction) with Recirc pumps but do not reduce flow < 34 Mlb/hr
- D. Place DIV II Core Spray in Torus Mixing Mode, restore Core Spray to operable status within 7 days AND restore SRV H to operable status within 14 days

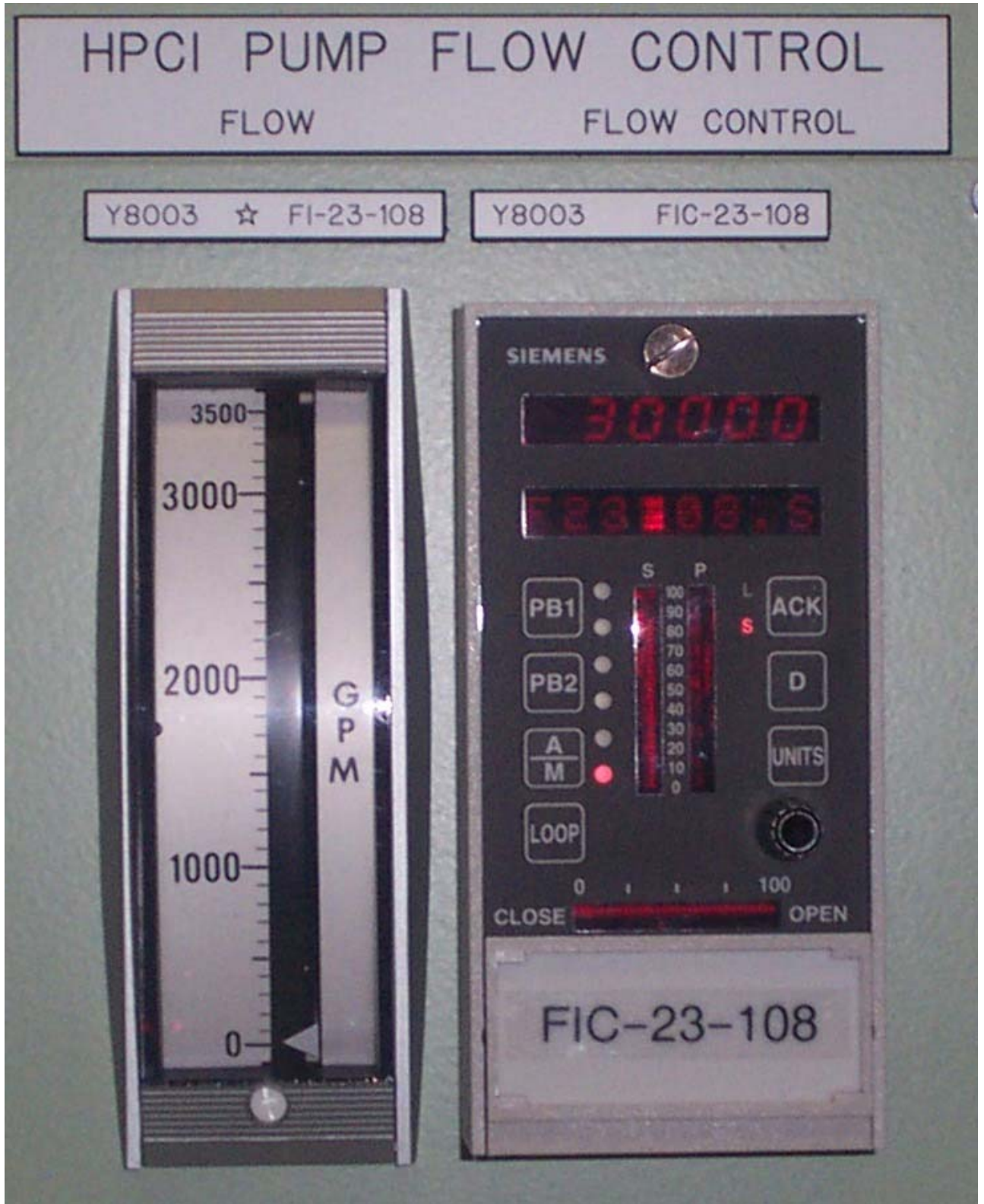
Answer: A is correct. With the flow controller in manual HPCI is inoperable. With Core Spray inoperable 3.5.1 Condition I requires that Core Spray or HPCI be returned to service in 72 hours.

Distracter B is incorrect. Torus Cooling in service and HPCI inoperable TS 3.5.1 condition L would require to be in Mode 3 in 12 hours and ≤ 150 psig in 36 hrs

Distracter C is incorrect. This action could be performed but recirc flow must remain ≥ 35 Mlb/hr. (This is a recent change as 34 Mlb/hr was the required flow value prior to RFO 23.

Distracter D is incorrect. Core Spray or HPCI must be restored in 72 hours

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)



2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 14

Tier: 1

Group: 2

K/A: 262002

UPS (AC/DC)

A2.01

SRO 2.8

Ability to (a) predict the impacts of the following on the UNINTERRUPTABLE POWER SUPPLY (A.C/D.C); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Under voltage

Reference: C.4-B.09.13.E & G

LP Objective: M8114L-003, 2.g

Reference provided during exam: None

Cognitive level: 2RI

Difficulty: 3

10CFR55.43(b) Ref: (5)

Source: New

The plant is operating at rated conditions. Given the following conditions:

- Outside air temp is 89°F
- Static Inverter Y-81 tagged out for maintenance.
- Y-81 loads are being powered via MBS Y-83
- Breaker B4482 (Y82 120V INST AC ALT SOURCE XFMR) trips on over current.

For the conditions given above, which procedure must be prioritized FIRST to mitigate this event?

- A. C.4-F (Rapid Power Reduction)
- B. C.4-K (Immediate Reactor Shutdown)
- C. C.4-B.06.03.A (Decreasing Condenser Vacuum)
- D. C.4-B.05.07.A (Loss of Reactor Water Level Control)

Answer: D is correct. The above conditions result in a loss of Y-30 and Y-80. The C.4 for a loss of Y-80 directs performance of C.4 for Y-30 first. A loss of Y-30 results in a lock of both FW REG valves requiring entry into C.4-B.05.07.A. Once locked, they drift in the open or closed direction resulting in a low level scram or high level turbine and RFP trip if not addressed immediately.

Distracter A is incorrect. This is a correct action, but is an action called for in the Group 2 isolation procedure which is called for in the loss of Y-80 procedure this is not priority over level control IAW loss of Y-80 procedure

Distracter B is incorrect. C.4-K (Immediate Reactor Shutdown) would be entered if rods began to drift (CRD flow control valve fails open) but is not expected.

Distracter C is incorrect. Air ejector supply valves fail open on a loss of Y-30. Condenser vacuum may degrade but a scram is not expected and taking manual control of MS-23-1/2 will control condenser vacuum.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 15

Tier: 2

Group: 1

K/A: 264000

EDGs

2.4.22

SRO 4.0

Knowledge of the basis for prioritizing safety functions during abnormal / emergency operations

Reference: C.6-008-C-17

LP Objective: M8107L-042, 2,g

Reference provided during exam: EOP Flow Charts

Cognitive level: 3SPK

Difficulty: 3

10CFR55.43(b) Ref: (5)

Source: New

The plant is operating at rated conditions when a LONOP and small break LOCA occurred. Given the following:

- 15 Bus is LOCKED out
- 12 EDG-ESW pump failed to start
- 11 Service Water pump is running
- Drywell pressure is 2.2 psig and slowly rising
- Drywell temperature is 138°F and slowly rising
- RPV pressure is 820 psig and slowly lowering
- RPV water level is –10 inches and slowly rising using HPCI

Which of the following directions should be prioritized FIRST?

- A. Place Torus sprays in service
- B. Restore cooling to the #12 EDG
- C. Start all available Drywell cooling
- D. Prevent Core Spray and LPCI injection

Answer: B is correct. With a LONOP and a loss of 12 ESW PUMP the 12 EDG will be running without cooling water. Not establishing cooling will result in a loss of safety function as the diesel would trip and de-energize bus 16 reducing the plant to the minimum available ECCS systems. A MOD during RFO23 changed the SW lineup to the EDGs requiring manual manipulation of valves to provide SW cooling to the EDGs when the associated ESW pump fails to start.

Distracter A is incorrect. Although this action may be performed IAW C.5-1200 it is not required until 12 psig in the Drywell.

Distracter C is incorrect. This action may be performed but RBBCW is not available as a cooling medium as the RBCCW pumps are load shed at this time.

Distracter D is incorrect. Although this action may be performed IAW C.5-1100 it is not urgent at this time as reactor pressure is above the shutoff head of the low pressure ECCS pumps.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 16

Tier: 2

Group: 2

K/A: 201002

RMCS

2.2.12

SRO 3.4

Knowledge of surveillance procedures

Reference: SR 3.0, TS 3.1.3

LP Objective: MT-OPS-ITS-002L, 3.01

Reference provided during exam: SR 3.0, TS 3.1.3, 2007 calendar

Cognitive level: 3SPR

Difficulty: 3

10CFR55.43(b) Ref: (2)

Source: New

The plant has been operating at rated conditions for several months. On August 6th at 1300 it was discovered that SR 3.1.3.3 had not been performed on control rod 26-19 since June 28th at 0800. Given the following:

- Control rod 26-19 is at position 12
- It has been determined that the risk impact can be managed

Determine if an extension is allowed, if so, when is the latest the surveillance can be completed and remain in compliance with Technical Specifications?

- A. Perform the surveillance prior to August 7th at 0200.
- B. Perform the surveillance prior to August 7th at 1300.
- C. Perform the surveillance prior to September 6th at 1300.
- D. An extension IS NOT allowed, immediately enter the ACTIONS of TS 3.1.3.

Answer: C is correct. SR 3.1.3.3 has a 31 day frequency with a 1.25 times grace period which would require the SR to have been performed by 0200 on August 6th. SR 3.0.3 allows from time of discovery, 24 hours or the length of the specified frequency which ever is greater to perform the surveillance. Note: 24 hours can only be exceeded if a risk evaluation has been performed. 31 days past time of discovery is equal to September 6th at 1300.

Distracter A is incorrect. Plausible for miscalculation of days

Distracter B is incorrect. Plausible if a risk assessment wasn't performed

Distracter D is incorrect. SR 3.0.3 allows delay of entering actions.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 17

Tier: 2

Group: 2

K/A: 202002

Recirculation Flow Control

A2.02

SRO 3.0

Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: loss of A.C.

Reference: C.5.1-1000, C.5.1-2007, C.5-2007, C.4-A, and C.4-B.09.07.E

LP Objective: M8114L-001, 4.f and M8114L-005, 3.b, c

Reference provided during exam: EOP Flow Charts

Cognitive level: 3SPR

Difficulty: 2

10CFR55.43(b) Ref: (5)

Source: New

The plant is operating at 50% power with #12 Circulating Water Pump isolated for required maintenance. The following events occur:

- Lockout on Bus 13
- LC-107 fails to reenergize
- The reactor is scrammed
- Ten control rods are at position 48
- IRMs are reading 75 on range 7 and lowering

As the CRS, which of the following actions should be directed?

- A. Trip both recirc pumps IAW C.4-A
- B. Trip both recirc pumps IAW C.5-2007
- C. Defeat low-low RPV water level MSIV isolation IAW C.5-3301
- D. Manually open enough SRV's and lower RPV pressure to 930 psig

Answer: A is correct. With no power on LC-107, MCC-114 will be deenergized and a scoop tube lock will have occurred and the recirc pumps will not runback. C.5-2007 directs the CRS to leave the power leg (reactor is not critical) and enter C.4-A. IAW C.4-A (Reactor Scram), if the recirc pumps do not runback they should be tripped.

Distracter B is incorrect. For the given ATWS condition, the reactor is not critical. C.5-2007 (Failure to Scram) requires the power leg to be exited and enter C.4-A

Distracter C is incorrect. This action cannot be performed because the condenser is not available due to loss of both circulating pumps (#12 isolated and #11 powered from bus 13).

Distracter D is incorrect. For the given conditions reactor power is not sufficient to cause rapid SRV cycling.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 18

Tier: 2

Group: 2

K/A: 259001

Reactor Feedwater

A2.07

SRO 3.8

Ability to (a) predict the impacts of the following on the REACTOR FEEDWATER SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

Reactor water level control system malfunctions

Reference: B.05.07-01, C.4-B.05.07.A

LP Objective: M8114L-002, 2.g

Reference provided during exam: None

Cognitive level: 3PEO/SPR

Difficulty: 2

10CFR55.43(b) Ref: (5)

Source: 2005 NRC

The plant was operating at 7% with a startup in progress. Predict the impact if there was a loss of controller signal to the in-service Level Control Valve, and what action should be directed to mitigate this abnormal condition.

RPV water level would (1) and the CRS should direct the crew to (2).

- | | | |
|----|----------------------------|--|
| | <u>(1)</u> | <u>(2)</u> |
| A. | remain relatively constant | adjust RWCU dump flow as required |
| B. | rise | raise reactor power |
| C. | lower | lower reactor power |
| D. | lower | take local manual control of the valve |

Answer: D is correct. At 7% power the candidate must recognize the low flow feed reg. Valve would be in service. This valve fails closed upon a loss of electrical control signal causing RPV water level to decrease. B.05.07 describes taking local manual control.

Distracter A is incorrect. This could be a misconception as the Main FRV will lock "as is" with a loss of signal. Adjusting the dump valve would be prescribed action if a MFWRV was in service.

Distracter B is incorrect. The valve fails closed vice open. The use of recirc to control level with power may be done at higher powers, but at 7%, recirc should not be used as it is at minimum speed

Distracter C is incorrect. Level would decrease, at 7% power recirc pump speed is at minimum. Lowering power with control rods would be unconservative.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 19

Tier: 3

K/A: 2.1.25 SRO 3.1

Ability to obtain and interpret station reference materials such as graphs / monographs / and tables which contain performance data

Reference: TS 3.1.7

LP Objective: M8107L-004, 11.c, d

Reference provided during exam: TS 3.1.7 and figures

Cognitive level: 3SPR **Difficulty:** 3 **10CFR55.43(b) Ref:** (2)(5)

Source: Bank

The plant is operating at rated conditions. While performing the SBLC operability surveillance Test, the Out-plant Operator inadvertently drained an unknown volume of solution from the storage tank. The following information has been obtained.

- Tank level indication is 1150 gallons.
- Boron enrichment is 58 percent.
- Boron solution concentration is 12.6 percent.
- Pump flow rate is 26 gpm at 1275 psig.
- Boron solution temperature is 70°F.

Is the SBLC system OPERABLE or INOPERABLE and why?

- A. The SBLC system is OPERABLE. Existing conditions satisfy Table 3.1.7-1 Equations 1 and 2.
- B. The SBLC system is INOPERABLE; a minimum of 50 gallons of demin water must be added to declare the SBLC system operable.
- C. The SBLC system is INOPERABLE; boron concentration must be raised a minimum of 0.62 percent to declare the SBLC system operable.
- D. The SBLC system is OPERABLE. Tank volume and Boron concentration are within the allowed operation region of Figure 3.1.7-1 of Technical Specifications.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Answer: A is correct. Figure 3.1.7-1 is not satisfied but Equations 1 and 2 are

$$V \geq \left(\frac{71.18}{0.0051 \times 12.6 + 0.998} \right) \left(1 + \frac{4821}{1101-58} \right) \left(\frac{19.8}{58} \right) \left(\frac{100}{12.6} \right) + 128 \text{ gal}$$

$$V \geq (67.02) (5.62) (0.341) (7.936) + 128 \text{ gal}$$

$$\mathbf{1150 \geq 1147 \text{ gal}}$$

$$C \geq 8.28 \left(\frac{86}{26} \right) \left(\frac{19.8}{58} \right)$$

$$C \geq 8.28 (3.31) (0.341)$$

$$\mathbf{12.6 \geq 9.34}$$

Distracter B is incorrect. Although raising tank volume by 50 gallons would be in the allowed operating region, the system is not inoperable because Equation 1 and 2 were originally met.

Distracter C is incorrect. Although raising concentration by 0.62 weight percent would be in the allowed operating region, the system is not inoperable because Equation 1 and 2 were originally met.

Distracter D is incorrect. With the given conditions, operation is not allowed IAW Figure 3.1.7-1.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 20

Tier: 3

K/A: 2.1.33 4.0 SRO

Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Reference: B.07.01-05 and TS 3.4.4

LP Objective: M8107L-101, 10, 11 and MT-OPS-ITS-007L, 0344

Reference provided during exam: TS 3.4.4, Completed Pages 11, 12 and 13 of 0000-J

Cognitive level: 3SPR

Difficulty: 3

10CFR55.43(b) Ref: (2)

Source: New

A plant startup is in progress with the reactor critical and a positive period established in the intermediate range. The Duty RO has completed OPERATIONS DAILY LOG – PART J and has given it to you for review.

After reviewing the given completed portions of OPERATIONS DAILY LOG – PART J, which of the following, if any, describes the Technical Specification required action and completion time?

- A. None, RCS Operational LEAKAGE is within limits
- B. Reduce RCS Total LEAKAGE to within limits in 4 hours
- C. Reduce RCS Unidentified LEAKAGE to within limits in 4 hours
- D. Verify RCS Unidentified LEAKAGE increase is not service sensitive type 304 or type 316 austenitic stainless steel in 4 hours

Answer: C is correct. The provided daily log is incorrectly calculated. With the given log information the unidentified leakage is >5 gpm which requires restoration within 4 hours.

Distracter A is incorrect. Plausible answer if candidate doesn't recalculate and identify greater than 5 gpm unidentified leakage.

Distracter B is incorrect. Total leakage is high but within limits.

Distracter D is incorrect. The leakage increase is >2 gpm. The LCO and associated action is required to be entered if the plant is in Mode 1. Current plant conditions define Mode 2.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 21

Tier: 3

K/A: 2.2.22 4.1 SRO

Knowledge of limiting conditions for operations and safety limits

Reference: TS 2.1.1.2, 2.2 and 3.2.2

LP Objective: MT-OPS-ITS-003L, 2.02, 2.03

Reference provided during exam: Technical Specification (Safety Limit Section 2 removed)

Cognitive level: 3 SPR **Difficulty:** 3 **10CFR55.43(b) Ref:** (2)

Source: New

The plant is operating in single loop with the following conditions:

- Reactor power is 50%
- MCPR is determined to be 1.10

Which of the following, if any, is the required action that must be directed to satisfy Technical Specifications?

- A. Insert control rods until RTP < 25%
- B. No action required, maintain MCPR ≥ 1.10
- C. Fully insert all insertable control rods within 2 hours.
- D. Restore MCPR to within COLR limits within 2 hours.

Answer: C is correct. During single loop operation MCPR must remain ≥ 1.12 . If this is violated compliance must be restored and all insertable control rods must be inserted within 2 hours. This is met by inserting all control rods

Note: Safety limit section of tech specs is removed from the candidate's provided reference material. This will require the candidate to know from memory the safety limit setting and required action.

Distracter A, B and D are incorrect. These don't meet safety limit minimum required actions.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 22

Tier: 3

K/A: 2.2.13 3.8 SRO

Knowledge of tagging and clearance procedures

Reference: 4 AWI-04.05.04 and FP-OP-TAG-02

LP Objective: M8108L-039, 1.m

Reference provided during exam: None

Cognitive level: 1F

Difficulty: 2

10CFR55.43(b) Ref: (5)

Source: New

Which of the following fleet tagging responsibilities can ONLY be carried out by Operations Shift Supervision or persons designated by Operations Management in the Work Control Center (WCC)?

- A. Status a clearance checklist to "Distributed"
- B. Status a clearance order to "Working"
- C. Authorize more than one holder at a time for each operating permit.
- D. Direct Primary Authorized Employee(s) to release OR verify released all stored energy prior to start of work.

Answer: A is correct. Can only be performed by Operations Shift Supervision or persons designated by Operations Management.

Distracter B is incorrect. Craft supervisors may take a clearance order to working

Distracter C is incorrect. An operating permit can only have one holder.

Distracter D is incorrect. Craft supervisors direct personnel to perform the SERT

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 23

Tier: 3

K/A: 2.3.2 2.9 SRO

Knowledge of facility ALARA program

Reference: 4AWI-08.04.01, GET-Radiation Worker

LP Objective: M8108L-039, 1.aa

Reference provided during exam: None

Cognitive level: 3 SPK

Difficulty: 3

10CFR55.43(b) Ref: (4)

Source: New

As the CRS, you had been working with the Reactor Building Operator and the ALARA Coordinator to determine the best way to perform an upcoming evolution in the plant. The following facts are known:

- Past task performance has resulted in an average exposure of 550 mrem
- The task historically required 2 hours to complete
- If shielding is hung it would lower the dose rate by 25%
- The total dose to hang and remove the shielding is estimated to be 220 mrem
- A special tool is available to perform the task that would allow the operator to be in a lower exposure area (200 mrem/hr)
- Use of the special tool is estimated to extend the job time by 40%

What direction must the CRS provide to the Reactor Building Operator and the ALARA Coordinator to ensure that the task is performed within the principles of ALARA?

- A. Hang the shielding AND use the special tool
- B. DO NOT use the shielding, but use the special tool
- C. Hang the shielding, but DO NOT use the special tool
- D. DO NOT use the shielding AND DO NOT use the special tool

Answer: D is correct. This represents a total dose of 550 mr for the operator

Distracter A is incorrect. Shielding makes 206.25 mr/hr field, tool reduces dose to 200mr/hr, this results in a dose of 400 mr, the task now takes 40% longer adding 160 mr, the dose for hanging shielding adds 220 mr for a total of 780 mr.

Distracter B is incorrect. This is 200 times 2.8, which equals 560 mr

Distracter C is incorrect. This is 206.25 mr/hr x 2 hrs +220 mr which is 632.5 mr

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 24

Tier: 3

K/A: 2.3.9 3.4 SRO

Knowledge of the process for performing a containment purge

Reference: 2140

LP Objective: M8107L-044, 11.c, d

Reference provided during exam: None

Cognitive level: 1F, 1P

Difficulty: 3

10CFR55.43(b) Ref: (2)(4)

Source: New

A plant shutdown is in progress with reactor power at 25%. De-inerting preparations are in progress IAW 2140 (DEINERTING PRIMARY CONTAINMENT).

As the CRS, you are required to...

- A. De-inert by venting primary containment through the Reactor Building plenum.
- B. Complete de-inerting within 24 hours of the time the primary containment purge was initiated.
- C. Verify an analysis of primary containment atmosphere has been completed within the previous 24 hours.
- D. Stop the primary containment purge once the drywell equipment hatch, drywell personnel hatch, or torus manway are opened.

Answer: C is correct IAW 2140

Distracter A is incorrect. De-inerting is now performed via the stack. This is a procedural change (due to the recent transition from CTS to ITS) to prohibit venting out the RB vent path.

Distracter B is incorrect. Reactor power must be <15% within 24 hours of the de-inerting commencing.

Distracter D is incorrect. Purge is not required to continue if any of these hatches are opened, however, permission from the safety manager is required prior to stopping the purge (airflow through containment) due to personnel safety concerns.

2007 ILT SRO (U) RETAKE NRC EXAM KEY (M8100Q-0713)

Question 25

Tier: 3

K/A: 2.4.6 4.0 SRO

Knowledge of symptom based EOP mitigation strategies.

Reference: C.5-1-1000, C.5-1-1100, and C.5-1100

LP Objective: M8114L-005, 2b, 3.b, c

Reference provided during exam: EOP Flow Charts

Cognitive level: 3SPR

Difficulty: 3

10CFR55.43(b) Ref: (5)

Source: New

The plant is operating at 60% power when an unisolable reactor coolant leak occurs in the RWCU pump room. Given the following:

- SBTG has automatically initiated
- RWCU Pump Room temperature is 215°F and rising
- 962-foot elevation outside the RWCU Pump Room is 205°F and rising
- 962-foot elevation outside the RWCU Pump Room is 1100 mrem/hr and rising

As the CRS, which of the following actions is required to be taken for the above conditions?

- A. Open all 3 ADS valves and rapidly depressurize the RPV
- B. Stabilize RPV pressure and maintain cooldown rate <100°F/hr
- C. Restart Turbine Building Ventilation to ensure a diluted elevated release
- D. Open main turbine bypass valves and exceed a 100°F/hour cooldown rate

Answer: D is correct. With the conditions stated, one area (Radiation) has already reached the max safe level and temperature is approaching but not exceeding. C.5-1300 requires a blowdown when two parameters exceed max safe. IAW C.5-1100, if a blowdown is "anticipated" then the main turbine bypass valves should be opened and the 100°F/hour cooldown rate exceeded to allow dumping as much of the energy to the main condenser instead of the Torus.

Distracter A is incorrect. Only one max safe value in each area has been reached, emergency blowdown is not allowed at this time.

Distracter B is incorrect. IAW C.5-1100, this action would not be performed because it is overridden by rapidly depressurizing the RPV using bypass valves

Distracter C is incorrect. Turbine Building Ventilation should not be restarted as the increased pressure within the turbine building from ventilation restart would result in an unmonitored release through the reactor building plenum IAW C.4-B.4.1.B