Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	205000 K1.04	
	Importance Rating	2.7	

Knowledge of the physical connections and/or cause- effect relationships between SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following: Fuel pool cooling assist: Plant-Specific

Proposed Question: Common 1

Which ONE of the following describes the Fuel Pool Cooling Assist flowpath through RHR and the effect of a lowering Skimmer Surge Tank level.

A. Flow is through any RHR Loop returning to the spent fuel pool.
As Skimmer Surge Tank level lowers, NPSH would be diminished for the RHR pump.

B. Flow is through ONLY RHR Loops A or B returning to the spent fuel pool.
As Skimmer Surge Tank level lowers, NPSH would be diminished for the RHR pump.

C. Flow is through ONLY RHR Loops A or B returning to the spent fuel pool.
As Skimmer Surge Tank level lowers, RHR pump NPSH would be unaffected.

D. Flow is through any RHR Loop returning to the spent fuel pool.
As Skimmer Surge Tank level lowers, RHR pump NPSH would be unaffected.

Proposed Answer: B

Explanation (Optional): B. Correct

Per FPCCS Lesson Plan, Page 15, Section III.B.7
Skimmer Surge Tanks Provide net positive suction head (NPSH) for the FPCCS pumps and a RHR pump when operating in the augmented fuel pool cooling mode.

Per FPCCS Lesson Plan, Page 24, Section III.C.1.c.2).
Flow is from the skimmer surge tank outlet to the RHR System (either Loop A or B). Return from the RHR System is to the spent fuel storage pool only via a set of dedicated diffusers.

B. Correct.

A. Incorrect. Only RHR Loop A & B is used
C. Incorrect. RHR pump NPSH is also affected
D. Incorrect. Only RHR Loop A & B may be used. RHR pump NPSH is also affected

Technical Reference(s) LP- NOH01FPCCOO-05 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: RHRSYSE003 (As available)

Question Source:
Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level:
Memory or Fundamental Knowledge X
Comprehension or Analysis __

10 CFR Part 55 Content: 55.41 X

Comments: NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	218000 K1.02	
	Importance Rating	4.0	

Knowledge of the physical connections and/or cause-effect relationships between AUTOMATIC DEPRESSURIZATION SYSTEM and the following: Low pressure Core Spray

Proposed Question: Common 2

Which one of the following describes the ADS response to the ECCS pump discharge pressure permissive contact opening during the period of time the 105 second Delay Timer is timing out? (Assume all other permissives continue to be met and NO operator actions are taken).

The Delay Timer:

A. stops and ADS actuation will NOT occur even if the ECCS pump discharge pressure permissive contact is closed.

B. continues to time out and the ADS actuation will immediately occur when the ECCS pump discharge pressure permissive contact is closed.

C. de-energizes, resets to zero, then when the ECCS pump discharge pressure permissive is met, the Delay Timer starts a second cycle.

D. stops until the ECCS pump discharge pressure permissive contact is closed at which time ADS will initiate after the Delay Timer completes the cycle.

Proposed Answer: B

Explanation (Optional): IAW SN-0001:

3.3.1. The following signals (both Sub Channels B and F (or D and H) need to be energized) auto initiates ADS
1. Drywell Pressure (1.68 psig) (Seal-In)
OR 5 minute timer times out (for line breaks outside drywell) AND
2. Level 1 (-129 inches) AND
3. Confirmatory Level 3 (12.5 inches) AND
4. 105 second time delay AND
5. Core Spray discharge pressure 145 psig
OR RHR Pumps discharge pressure 125 psig.

Once the 105 second timer times out Core Spray and RHR pump discharge pressure is evaluated. ADS is actuated if the discharge pressure permissives are met.

B. Correct - LP ECCS status is evaluated after the 105 sec timer times out.

A. Incorrect - the 105 sec timer does not stop
C. Incorrect - there is no second cycle for the 105 second timer
D. Incorrect - the 105 sec timer does not stop

Technical Reference(s) HC.OP-SO.SN-0001 section 3.3.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: ADSSYSE002 (As available)

Question Source: Bank # 53287
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Half a KA mismatch, no changes

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	215004 K2.01	
	Importance Rating	2.6	

Knowledge of electrical power supplies to the following: SRM channels/detectors.

Proposed Question: Common 3

Given the following conditions:

- The plant is performing a startup
- All equipment is operable
- The RPS shorting links are installed

Then, the SRM 'A' drawer loses power

Which one of the following describes what supplies the SRM 'A' drawer and what is the plant response?

A. 125 VDC.
A Reactor Scram and rod block will occur

B. +24VDC.
A Reactor Scram and rod block will occur.

C. +24VDC.
A rod block will occur. A Reactor Scram will NOT occur.

D. 125 VDC.
A rod block will occur. A Reactor Scram will NOT occur.

Proposed Answer: C

Explanation (Optional):

IAW RPS Lesson Plan NOH01RPSOOC-05 - An SRM INOP condition will not initiate a Scram signal. [CR 960218138]

IAW SRM Lesson Plan – Section VII.B.2.a. - The +24 VDC supplies the detector HVPS. Loss of this power will result in a loss of the HVPS and generate a channel INOPERATIVE trip.

Loss of +24 VDC - The +24 VDC supplies the detector HVPS. Loss of this power will result in a loss of the HVPS and generate a channel INOPERATIVE trip.

Loss of 1BJ484 - Results in a loss of control and indications for the SRMS on 10C651. The SELECT, POSITION STATUS, POWER ON, DRIVING IN/OUT circuitry is lost.

IAW Section V.A.2.- ± 24 VDC Power System - supplies detector polarizing voltage and SRM logic modules.

C. Correct. – the loss of the 24 VDC will cause a loss of SRM logic modules and an inop trip and a withdraw block. No scram signal will occur

A. Incorrect. - +24 VDC is the power supply to the SRM HVPS ,A scram signal will not occur,
B. Incorrect. – A scram signal will not occur
D. Incorrect. – +24 VDC is the power supply to the SRM HVPS.

Technical Reference(s) LP - NOH01RPSOOC-05 (RPS) (Attach if not previously provided)
LP- (SRM)

Proposed references to be provided to applicants during examination: None

Learning Objective: SRMSYSE013 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
editorial

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	239002 K2.01	
	Importance Rating	2.8	

Knowledge of electrical power supplies to the following: SRV solenoids.

Proposed Question: Common 4

The plant is operating at rated power.

Which one of the following describes the effect of a loss of 125 VDC BD417, on the Automatic Depressurization System (ADS), if the required actuation setpoints were reached?

NOTE: Assume all other equipment is operable AND NO operator actions were taken to inhibit ADS

A. "A" ADS SRV pilot solenoids have lost power.
An ADS actuation would occur.

B. " A ADS SRV pilot solenoids have lost power.
An ADS actuation would NOT occur.

C. "B" ADS SRV pilot solenoids have lost power.
An ADS actuation would occur.

D. "B" ADS SRV pilot solenoids have lost power.
An ADS actuation would NOT occur.

Proposed Answer: A

Explanation (Optional):

A. Correct

IAW ADS Lesson Plan NOHOIADSSYSC-03 Section V.A.3 - 125 VDC Class 1E Distribution System - The 125 VDC Class 1E Distribution System supplies electrical power to the ADS SRV pilot solenoids and the ADS logic channels.
ADS Channel B logic and the A ADS SRV pilot solenoids are powered from 1BD417.
ADS Channel D logic and the B ADS SRV pilot solenoids are powered from 1DD417.

IAW Section III.B.1.a.2)b) - Satisfaction of either ADS Channel B or ADS Channel D will result in the actuation of the ADS and the depressurization of the RPV. This ensures that a single failure will neither initiate nor inhibit the ADS function.

B. Incorrect. – Channel D would cause an actuation
C. Incorrect. - DD417 supplies the B ADS SRV solenoids
D. Incorrect. – DD417 supplies B ADS SRV solenoids, Channel D would cause an actuation

Technical Reference(s) LP NOHOIADSSYSC-03 (ADS) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ADSSYSE007 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
NC – similar to SRO 90

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	217000 K3.03	
	Importance Rating	3.5	

Knowledge of the effect that a loss or malfunction of the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) will have on following: Decay Heat Removal.

Proposed Question: Common 5

Given the following conditions:

An automatic scram from 100% RTP occurs due to closure of the MSIVs.

Then, a total loss of SACs occurs. RCIC and HPCI room temperatures are currently at 162 degrees and rising at 1 degree per minute.

Which one of the following identifies the method(s) available to reduce RPV pressure and commence reactor cooldown 15 minutes from now?

A. SRVs ONLY.

B. RCIC & HPCI ONLY.

C. HPCI and SRVs ONLY.

D. SRVs, RCIC & HPCI.

Proposed Answer: A

Explanation (Optional):
IAW Lesson Plan (RCIC)
Section IV.E.2.a.7) – auto isolation - RCIC Room High Temperature; >160°F
Section IV.E.5.a.2) – RCIC Trip is caused by any RCIC Isoaltion
IAW HPCI Lesson Plan – Section IV.C.2.b. 1).d), page 105 – HPCI will isolate at a room temperature of 160 degrees.

A. Correct – both HPCI and RCIC would have isolated. SRVs are unaffected and available. RCIC will trip on isolation signal of >160 degrees, HPCI trips at >160 degrees

C. Incorrect – HPCI will isolate.

B. Incorrect - Both HPCI & RCIC would have isolated
D. Incorrect – Both HPCI & RCIC would have isolated

Technical Reference(s) RCIC Lesson Plan NOH04RCIC00-05 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: RCIC00E021 (As available)

Question Source: Bank # INPO Bank, Susq 2002
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Edit to loss of room cooling

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	206000 K3.03	
	Importance Rating	3.4	

Knowledge of the effect that a loss or malfunction of the HIGH PRESSURE COOLANT INJECTION SYSTEM will have on following: Suppression pool level control: BWR-2,3,4.

Proposed Question: Common 6

HPCl is in full flow test for RPV pressure control following a reactor scram. RPV level has recovered to +35 inches and is stable. All other containment parameters are normal.

Then, logic control power is lost to valve BJ-HV-F042 "PMP SUCT FROM SUPP CHB"

Which one of the following describes the effect of the loss?

A. CST level would be adversely affected because the valve would NOT auto-open on a HIGH CST level signal.

B. CST level would be adversely affected because the valve would NOT auto-close on a LOW CST level signal.

C. Suppression Pool level would be adversely affected because the valve would NOT auto-close on a LOW Suppression Pool level signal.

D. Suppression Pool level would be adversely affected because the valve would NOT auto-open on a HIGH Suppression Pool level signal.

Proposed Answer: D

Explanation (Optional):

IAW HC.OP-BJ-0001 - BJ-HV-F042 PMP SUCT FROM SUPP CHB-Auto closes on HPCl Div 1 Isolation signal (K51A). **Auto opens on CST low level OR Suppression Chamber high** level (K42), IF BJ-HV-F042 handswitch is not in AUTO OPEN OVRD AND no HPCl Div 1 Isolation signal (K51A). Opens manually IF no HPCl Div 1 Isolation signal (K51A).

D. Correct – valve would not auto open on SP level high

A. Incorrect – valve auto open on low CST level

B. Incorrect – valve only auto closes on an isolation signal

C. Incorrect – valve does not auto close on low SP level

Technical Reference(s) HC.OP-BJ-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: HPCI00E012 (As available)

Question Source: Bank # 53735
Modified Bank # ____ (Note changes or attach parent)
New ____

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis ____

10 CFR Part 55 Content: 55.41 X

Comments:
editorial

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	300000 K4.02	
	Importance Rating	3.0	

Knowledge of (INSTRUMENT AIR SYSTEM) design feature(s) and or interlocks which provide for the following: Cross-over to other air systems

Proposed Question: Common 7

The plant is operating at rated power when the following annunciators are received:

A2-A1, INST AIR HEADER A PRESSURE LO
A2-A2, INST AIR HEADER B PRESSURE LO
- A2-B1, COMPRESSED AIR SYSTEM TROUBLE
- A2-B2, COMPRESSED AIR PANEL 00C188

Current air pressures are:

- Service Air pressure is 87 psig.
- Instrument air pressure at the Emergency Instrument Air Receiver is 82 psig.
- Instrument air pressure at the Instrument Air Receivers is 77 psig.

What is the configuration of the Service and Instrument Air System?

A. Instrument Air Dryer 1AF104 Isolation Valve, HV-114.16, will be open.
The Standby Service Air Compressor will be running.

B. The Service Air Supply Header Isolation Valve, HV-7595, will be closed.
The Standby Service Air Compressor will be running.

C. Instrument Air Dryer 1AF104 Isolation Valve, HV-11416, will be closed.
The Emergency Instrument Air Compressor will NOT be running.

D. The Service Air Supply Header Isolation Valve, HV-7595, will be closed.
The Emergency Instrument Air Compressor will NOT be running.

Proposed Answer: A

Explanation (Optional):
IAW HC.OP-AB.COMP-0001 & Lesson Plan NOH01INSAIR-02 (Instrument air) – Section IV.C.1.g. – page 57 - As the loss of air event starts, there is very little effect on plant operation. As air pressure begins to decrease, some automatic actions will occur that will attempt to stop the loss of air.

- Standby Service Air Compressor starts (92 psig)
- Emergency Instrument Air Compressor starts (85 psig)
- Instrument Air Dryer 1AF104 isolation valve (HV-11416) opens (85 psig)
- Service Air Header Isolation Valve (HV-7595) closes (70 psig Instrument Air pressure)

A. Correct. The Standby Service Air Compressor starts at 92#, HV-11416 opens at 85#

B. Incorrect - The Service Air Supply Header Isolation Valve, HV-7595 will be open
C. Incorrect - Instrument Air Dryer 1AF104 Isolation Valve, HV-11416 opens at 85#. Emergency Instrument Air Compressor starts (85 psig) and would be running
D. Incorrect - The Service Air Supply Header Isolation Valve, HV-7595 closes at 70#, the Standby Service Air Compressor starts at 92#. Emergency Instrument Air Compressor starts (85 psig) and would be running

Technical Reference(s) HC.OP-AB.COMP-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: INSAIRE006 (As available)

Question Source: Bank # 56927
Modified Bank # ____ (Note changes or attach parent)
New ____

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis ____

10 CFR Part 55 Content: 55.41 X

Comments:
C& D – changed to EAIC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	262001 K4.05	
	Importance Rating	3.4	

Knowledge of A C ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following Paralleling of A C sources (synchroscope)

Proposed Question: Common 8

A unit startup is in progress, the main generator is being synchronized to the grid. The following indications are observed:

- Keylocked SYNC SCOPE switch in the ON position
- Sync Scope and voltages indicate the first main generator output breaker is ready for closure

The operator depresses the BS2-6 CLOSE pushbutton, but the breaker fails to close.

Which condition prevented breaker closure?

A. The 52x60 Generator Disconnect is open.

B. The main generator exciter field breaker is open.

C. The SYNC CHECK ON pushbutton was NOT held depressed before depressing the CLOSE pushbutton.

D. The SYNC CHECK OFF pushbutton was NOT held depressed before depressing the CLOSE pushbutton.

Proposed Answer: D

Reference: HC.OP-SO.MA-0001 – Section 5.2.16. **PERFORM** the following to synchronize the Main Generator using Manual Load Control:

D. **PERFORM** the following (with Steps 2 thru 5 being performed in rapid succession):
1. WHEN SYNCHROSCOPE Pointer is at 5 minutes before 12 O'clock position,
PRESS AND **HOLD** SYNCH CHECK OFF push-button. ____
2. WHEN SYNCHROSCOPE Pointer is at 2 minutes before 12 O'clock position,
CLOSE BS 6-5 (BS-2-6) Breaker. ____

3. RELEASE the SYNCH CHECK OFF push-button.

D. Correct - The SYNC CHECK OFF pushbutton was not held depressed before depressing the CLOSE pushbutton. The OFF button is required to be held IAW HC.OP-SO.MA-0001.

A. Incorrect - The 52x60 Generator Disconnect is open. For the sync scope and voltages to indicate that the machine is properly synchronized the exciter field breaker and 52x60 must both be closed.
B. Incorrect - The SYNC CHECK ON pushbutton was not held depressed before depressing the CLOSE pushbutton. The OFF button is required to be held IAW HC.OP-SO.MA-0001.
C. Incorrect - The main generator exciter field breaker is open. For the sync scope and voltages to indicate that the machine is properly synchronized the exciter field breaker and 52x60 must both be closed.

Technical Reference(s) HC.OP-SO.MA-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: MNPWR0E016 (As available)

Question Source: Bank # 56833
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	264000 K5.06	
	Importance Rating	3.4	

Knowledge of the operational implications of the following concepts as they apply to EMERGENCY GENERATORS (DIESEL/JET) : Load Sequencing

Proposed Question: Common 9

The plant experienced a loss of 10A401.

The bus was subsequently restored to the normal lineup.

However, before the load sequencer was reset, all power was again lost to 10A401.

How will the EDG and electrical distribution system respond to this event?

A The EDG will automatically start. The loads on bus 10A401 will sequence on after the output breaker is closed.

B. The EDG will automatically start. The loads on bus 10A401 will NOT sequence on after the output breaker is closed.

C. The EDG will require a manual start. The loads on bus 10A401 will sequence on after the output breaker is closed.

D. The EDG will require a manual start. The loads on bus 10A401 will NOT sequence on after the output breaker is closed.

Proposed Answer: B

Explanation (Optional):

B. Correct – The EDG will start on the loss of power to the bus. Without the sequencer being reset, no loads will sequence onto the bus.

A. Incorrect – The loads will not sequence on.
C. Incorrect – The EDG will auto start when the bus loses power.
D. Incorrect – The EDG will auto start when the bus loses power. Without the sequencer being reset, no loads will sequence onto the bus.

Technical Reference(s) AB-ZZ-135 (Attach if not previously provided)

1EAC00E007

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

Question Source: Bank # INPO Bank 25444

Modified Bank # _____ (Note changes or attach parent)

New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

_____

Comments:

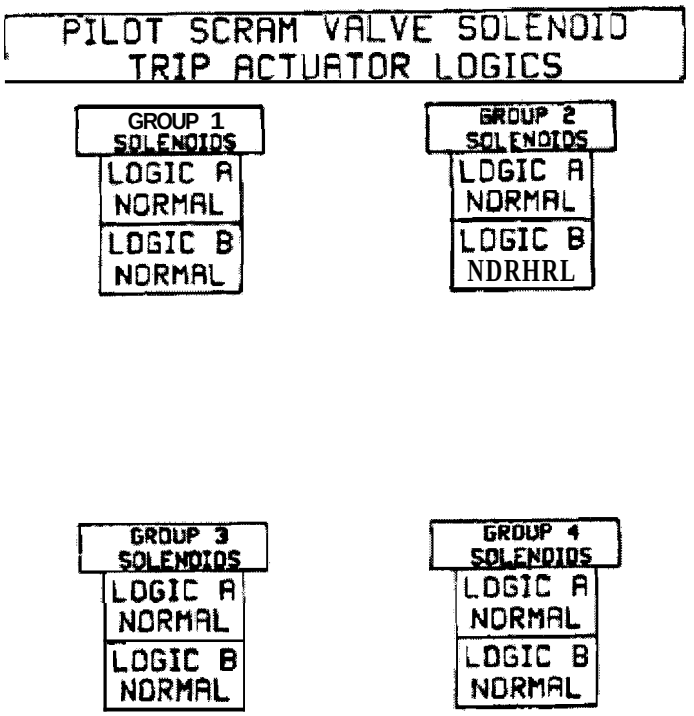
Is there a way to ask this using an incomplete sequencing scenario – leave as is

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	WA #	212000 K5.02	
	Importance Rating	3.3	

Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM : Specific logic arrangements.

Proposed Question: Common 10

The reactor is operating at 100% power. The operator observes the Logic A Normal light under the Group 1 Solenoids is NOT illuminated. The cause is NOT a bad light bulb.



Given this condition, if a half-scram condition occurs on the ____ logic, ___ of the control rods will scram.

(Chose answer based on logic function ONLY)

A. 'B1'; 1/2

B. 'A2'; 1/2

C. 'A1'; 1/4

D. 'B2'; 1/4

Proposed Answer: D

a. Explanation (Optional): IAW RPS Lesson Plan NOHO'l RPSOOC-05 Section II.C.4.c. - Energized trip systems maintain the scram pilot valve solenoids energized
   1) Two contacts in series are maintained closed to energize the A (B) solenoid
   a) One contact will open with a scram signal in trip channel A1 (B1)
   b) The other contact will open with a scram signal in trip channel A2 (B2)
   2) Either A1 or A2 trip channel will de-energize the A solenoids for a half-scram.
   3) Either B1 or B2 trip channel will de-energize the B solenoids for a half-scram.

D. Correct. ANY 'B' side RPS trip will de-energize the 'B' scram pilot solenoid valves for the GP1 rods, resulting in their scramming in. Each group comprises approximately 114 of the rods.

A. Incorrect. The 'A' scram pilot solenoid valves for the GP1 rods are already de-energized.

B. Incorrect. The 'A' scram pilot solenoid valves for the GP1 rods are already de-energized

C. Incorrect. ANY 'B' side RPS trip will de-energize the 'B' scram pilot solenoid valves for the GP1 rods, resulting in their scramming in. Each group comprises approximately 114 of the rods.

Technical Reference(s): Lesson Plan NOH01RPS00C-05 (Attach if not previously provided)
Prints PN1-C71-1020-006
Sheets 7, 13 ,14

Proposed references to be provided to applicants during examination: None

Learning Objective: RPS000E017 (As available)

Question Source: Bank # 62627
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments: editorial

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	KIA #	263000 K6.01	
	Importance Rating	3.2	

Knowledge of the effect that a loss or malfunction of the following will have on the D.C. ELECTRICAL DISTRIBUTION: A.C. electrical distribution.

Proposed Question: Common 11

The plant is operating at full power when a LOCA and a loss of offsite power (LOP) occur. Emergency diesel generators respond as designed.

WHICH one of the following describes the status of the 1E and Non-1E 125 VDC Battery Chargers 30 seconds after the event?

A. 1E battery chargers are in service and the Non-1E battery chargers are load shed and CANNOT be returned to service.

B. 1E and Non-1E battery chargers are load shed and both are automatically restored at the same time by load sequencing.

C. 1E battery chargers are in service and the Non-1E battery chargers are load shed and can be manually restored by overriding the load shed and re-energizing the MCC's.

D. 1E and Non-1E battery chargers are load shed; the 1E battery chargers are automatically restored by load sequencing and the Non-1E battery chargers will be restored 2 minutes after the sequencer starts.

Proposed Answer: C

Explanation (Optional):

IAW DC Electrical Lesson Plan section X.C.1.b. - Upon a LOCA, the MCCs that supply the battery chargers (excluding the guardhouse battery charger 10D514) are shed from the Class 1E 480 VAC Unit Substations that normally supply their power. Shedding of the MCCs places the 125 VDC (non- 1E) power requirements on the respective batteries.

The LOCA signal for the MCC feeder breakers can be overridden in the control room at 10C650

C. Correct - The 1E battery chargers supply breakers are not load shed. The Non-1E battery chargers can be restored manually.

A. Incorrect - The Non 1E chargers are not automatically restored after a LOCA.
B. Incorrect – The 1E chargers are not load shed. Non-1E battery chargers are not automatically restored.
D. Incorrect - The 1E battery chargers are not load shed. Non-1E battery chargers are not automatically restored

Technical Reference(s) OP-SO-SM-0001, Table SM-020 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: DCELECE015 (As available)

Question Source: Bank # 54243
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	WA #	215003 K6.05	
	Importance Rating	3.1	

Knowledge of the effect that a loss or malfunction of the following will have on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM: Trip units.

Proposed Question: Common 12

Given the following conditions:

- A plant startup is in progress
- IRM "G" is inoperable and bypassed
- All other IRMs are indicating on range 8

Then, a power failure occurs on the trip unit for IRM “E”.

Which one of the following describes the effects of this power failure to the IRM trip units?

A. With the mode switch in RUN, a half scram and rod block would occur.

B. With the mode switch in RUN, ONLY a rod block would occur.

C. With the mode switch in STARTUP, a half scram and rod block would occur.

D. With the mode switch in STARTUP, ONLY a rod block would occur.

Proposed Answer: C

Explanation (Optional): IAW LP NOH01IRMSYS-02 page 17 & 18

C. Correct. A loss of power

A. Incorrect. All scrams and rod blocks are bypassed with mode switch in RUN
B. Incorrect. All scrams and rod blocks are bypassed with mode switch in RUN to the trip units would cause a rod block and half scram with the mode switch in Startup
D. Incorrect. A half scram would also occur

Technical Reference(s) NOH01IRMSYS-02 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: IRMSYSE012 **(As** available)

Question Source: Bank #
Modified Bank # (Note changes or attach parent)
New X

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
editorial

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	203000 A1.01	
	Importance Rating	4.2	

Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: Reactor water level

Proposed Question: Common 13

Given the following conditions:

- The reactor is shutdown and is being cooled down
- RPV level is being held relatively constant at (-30) inches using Startup Level Control
- Reactor pressure is about 390 psig
- All rods are fully inserted

Then, 'C' RHR Loop initiation logic is inadvertently initiated in the LPCI mode, RHR LPCI Injection Valve BC-HV-F017C opens.

Which of the following describes the operational effect of this condition?

A. RPV level will rise and torus level will lower.

B. RPV level will lower and torus level will rise.

C. RPV level will rise and torus level will rise.

D. RPV level and torus level will remain relatively constant.

Proposed Answer: D

Explanation (Optional): IAW RHR LP NOH01RHRSYSC-06

D. Correct - The shut-off head of the RHR pumps is about 366 psig, the min flow valve will remain open. RPV level will remain relatively constant.

A. Incorrect – RHR will not be injecting so levels will remain relatively constant
B. Incorrect- Torus level will not be significantly affected when the RHR pump is at shutoff head
C. Incorrect- The shut-off head of the RHR pumps is about 366 psig. Levels should remain relatively unchanged because the RHR pump will not inject at shutoff head.

Technical Reference(s) RHR LP NOH01RHRSYSC-06 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RHRSYSE011 (As available)

Question Source: Bank # 56412
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	261000 A1.04	
	Importance Rating	3.0	

Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including: Secondary containment differential pressure

Proposed Question: Common 14

The plant is at full power. All systems are operable.

Reactor Building Ventilation (RBVS) is operating in a normal alignment

Which one the following describes the actions required when swapping over to FRVS IAW HC.OP-SO.GU-0001 "FRVS Operation" and their affect on Secondary Containment DIP throughout the evolution?

(Actions are listed in the order performed)

A. Remove the RBVS exhaust fan from service
Remove the RBVS supply fan from service
Start an FRVS vent fan
Start the FRVS recirc fans
DIP will remain negative

B. Remove the RBVS exhaust fan from service
Remove the RBVS supply fan from service
Start an FRVS vent fan
Start the FRVS recirc fans
Initially DIP will go positive but then return to negative

C. Start an FRVS vent fan
Remove the RBVS supply fan from service
Remove the RBVS exhaust fan from service
Start the FRVS recirc fans
DIP will remain negative

D. Start an FRVS vent fan
Remove the RBVS supply fan from service
Remove the RBVS exhaust fan from service
Start the FRVS recirc fans
Initially DIP will go positive but then return to negative

Proposed Answer: C

Explanation (Optional): IAW HC.OP-SO.GU-0001, Section 5.3.4 – The FRVS vent fan is first

action taken in the sequence. This will ensure a negative pressure in the RB when the RBVS exhaust fans are removed from service in the next sequenced step

C. Correct.

A. Incorrect. The FRVS vent fan must be started first
B. Incorrect. The FRVS vent fan must be started first
D. Incorrect – D/P will remain negative

Technical Reference(s) HC.OP-SO.GU-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RBVENTE005 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	211000 A2.04	
	Importance Rating	3.1	

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: Inadequate system flow.

Proposed Question: Common 15

The plant was operating at rated power when a Feedwater System malfunction occurred.
The following conditions now exist at the times given:

T= 0 minutes

- RPV level is -20 inches and stable
- Reactor power is at 8%
- Reactor Pressure is 920 psig
- ARI and RRCS have been manually initiated
- Drywell Pressure is 0.70 psig

T= 4 minutes

- RPV level is -18 inches and slowly rising
- Reactor power is at 7%
- Reactor Pressure is 919 psig
- Both SLC pumps are NOT running
- Drywell Pressure is 0.80 psig

Which one of the following describes whether the SLC system has responded as designed and any required action(s)?

A. The SLC system has responded properly. Turn the KEY-LOCK switches to ON and depress START PB for both pumps.

B. The SLC system has NOT responded properly. Turn the KEY-LOCK switches to ON and depress START PB for both pumps.

C. The SLC system has responded properly. Once 5 minutes (300 seconds) have elapsed since manual initiation, verify the auto start of both SLC pumps.

D. The SLC system has NOT responded properly. Once 5 minutes (300 seconds) have elapsed since manual initiation, verify the auto start of both SLC pumps.

Proposed Answer: B

Explanation (Optional):
IAW ARP C1-F1 & HC.OP-SO.SA-0001

B. Correct. IAW with ARP, If both pumps are not running with a valid signal present, turn the key lock on and start the pumps

A. Incorrect. Both pumps should be running with a manual initiation and the 230 second timer timed out
C. Incorrect. Both pumps should be running with a manual initiation and the 230 second timer timed out
D. Incorrect. Key lock must be turned on prior to starting pump

Technical Reference(s) ARP C1-F1 & HC.OP-SO.SA-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RRCS00E005 (As available)

Question Source: Bank # ____
Modified Bank # ____ (Note changes or attach parent)
New X

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge ____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	223002 K1.03	
	Importance Rating	3.0	

Knowledge of the physical connections and/or cause effect relationships between PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF and the following: Plant Ventilation

Proposed Question: Common 16

The plant is in OPCON 4 with the following conditions:

- Primary Containment has been de-inerted
- CACS is aligned to purge the drywell and suppression chamber
- The 'B' and 'C' Reactor Building Ventilation Supply and Exhaust Fans are running
- The 'A' Reactor Building Ventilation Supply and Exhaust Fans are in AUTO

Then, an operator arms and depresses the 'D' Channel PCIS Manual Initiation pushbutton on 10C651C for a surveillance test.

Two minutes later plant condition(s) stabilize.

Which one of the following describes the final status of the containment purge lineup and the Reactor Building Ventilation System (RBVS)?

A. The containment purge lineup will isolate. The Reactor Building Ventilation Fans will be unaffected.

B. The containment purge lineup will isolate. NO Reactor Building Ventilation fans will be running.

C. The containment purge lineup will NOT be affected. The Reactor Building Ventilation Fans will be unaffected.

D. The containment purge lineup will NOT be affected. NO Reactor Building Ventilation fans will be running.

Proposed Answer: B

Explanation (Optional):

B. Correct. Manual initiation of the 'D' Channel PCIS closes the GS-HV-4950, 4962, 4979, and 4980. These valves isolate the purge supply and exhaust lines. While the 'D' channel does not directly trip the running RBVS supply and exhaust fans, it will close the GU-HD-9414B and 9370B. These valves isolate the Reactor Building Ventilation System supply and exhaust lines, which will result in all running fans tripping on low flow after a 90 second time delay. The 'A' RBVS supply and exhaust fans are directly tripped (load shed) by the 'D' Channel PCIS signal.

A Incorrect – NO RBVS fans will be running

C. Incorrect – containment purge supply and exhaust will be isolated. NO RBVS fans will be running.

D. Incorrect – containment purge supply and exhaust will be isolated

Technical Reference(s) HC-OP.SO.SM-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: INERT0E012 (As available)

Question Source: Bank # 62574
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	262002 A3.01	
	Importance Rating	2.8	

Ability to monitor automatic operations of the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) including: Transfer from preferred to alternate source.

Proposed Question: Common 17

The Manual Bypass Control Switch on a NON 1E inverter has been placed in the "Bypass-to-Alternate" position for testing on a faulty Static Switch.
(Figure provided)

Which of the following describes the design response if a LOP occurs?

The input to the Static Inverter section will be from…

A. 125 VDC but supply to the system loads will be lost.

B. 125 VDC and maintaining system loads.

C. 480 VAC and maintaining system loads.

D. 480 VAC but supply to the system loads will be lost.

Proposed Answer: A

Explanation (Optional): See attached diagram from HC.OP-SO.PN-0001(Q) Exhibit 2.

A. Correct. The input of the static inverter will be supplied by 125 VDC power but supply to the system loads will be lost - Placing the switch in Bypass to Alternate closes contacts 1,2 and 5 meaning supply to system loads is off the AlternateIBackup supply which is not 1E supplied so loads are lost.

B. Incorrect. The input of the static inverter will be supplied by 125 VDC power and maintaining system loads - contacts 1,2 and 5 meaning supply to system loads is off the AlternateIBackup supply

C. Incorrect. The input of the static inverter will be supplied by 480 VAC power and maintaining system loads - AlternateIBackup supply which is not 1E supplied so loads are lost.

D. Incorrect. The input of the static inverter will be supplied by 480 VAC power but supply to the system loads will be lost - Placing the switch in Bypass to Alternate closes contactsd 1,2 and 5 meaning supply to system loads is off the AlternateIBackup supply.

Technical Reference(s) HC.OP-SO.PN-0001(Q) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: NON1E0E003 (As available)

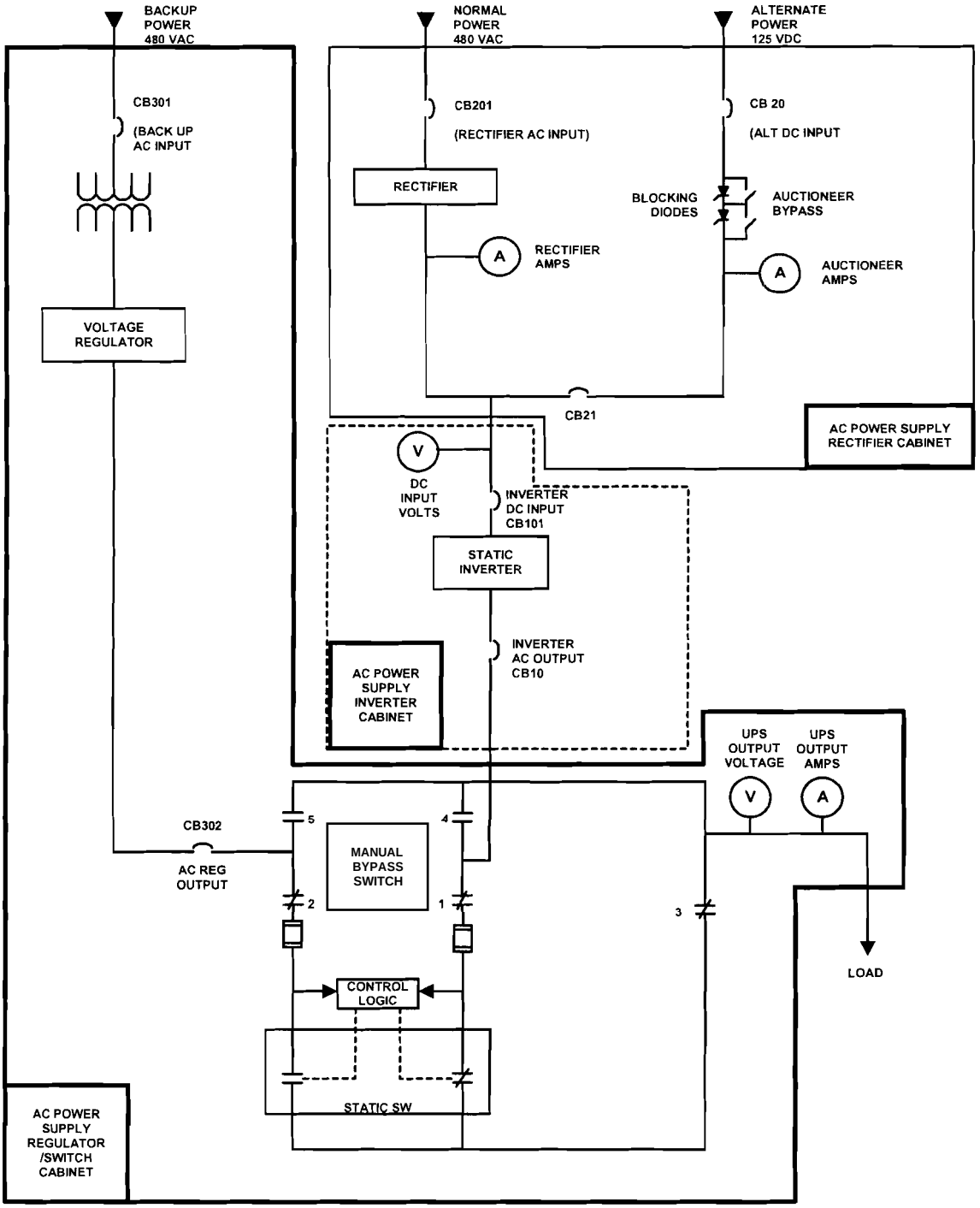
Question Source: Bank # 56822
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:


BACKUP POWER 480 VAC
NORMAL POWER 480 VAC
ALTERNATE POWER 125 VDC
CB301
(BACK UP AC INPUT
CB201
(RECTIFIER AC INPUT)
CB 20
(ALT DC INPUT
RECTIFIER
BLOCKING DIODES
AUCTIONEER BYPASS
A
RECTIFIER AMPS
A
AUCTIONEER AMPS
VOLTAGE REGULATOR
CB21
AC POWER SUPPLY RECTIFIER CABINET
V
DC INPUT VOLTS
INVERTER DC INPUT CB101
STATIC INVERTER
INVERTER AC OUTPUT CB10
AC POWER SUPPLY INVERTER CABINET
UPS OUTPUT VOLTAGE
UPS OUTPUT AMPS
V
A
CB302
AC REG OUTPUT
5
4
MANUAL BYPASS SWITCH
2
1
3
LOAD
CONTROL LOGIC
STATIC SW
AC POWER SUPPLY REGULATOR /SWITCH CABINET

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	209001 A3.03	
	Importance Rating	3.5	

Ability to monitor automatic operations of the LOW PRESSURE CORE SPRAY SYSTEM including: System pressure.

Proposed Question: Common 18

An event has occurred at the plant.

All Core Spray Loops are injecting to the RPV when the Core Spray Min Flow Valve BE-HV-F031A inadvertently strokes open due to a malfunction of FISH-N651A.

How will this affect Core Spray discharge pressure and total indicated flow in the "A" Loop in the control room?

A. Discharge pressure will increase.
Indicated flow will decrease.

B. Discharge pressure will increase.
Indicated flow will increase.

C. Discharge pressure will decrease.
Indicated flow will decrease.

D. Discharge pressure will decrease.
Indicated flow will increase.

Proposed Answer: C

Explanation (Optional):

C. Correct. Due to where the Flow indicator and min flow taps off in the system

A. Incorrect. Discharge pressure will decrease

B. Incorrect. Discharge pressure will decrease, indicated flow will decrease

D. Incorrect. indicated flow will decrease

Technical Reference(s) M-52 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: M-52

Learning Objective: CSSYSE004 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

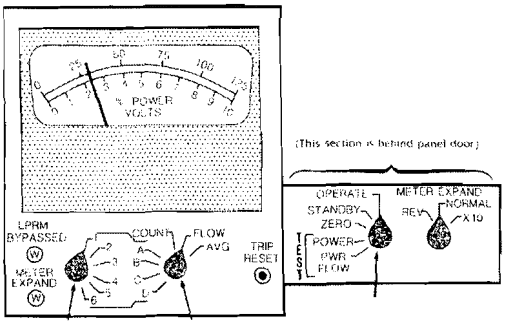
10 CFR Part 55 Content: 55.41 X
_____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	215005 A4.03	
	Importance Rating	3.2	

Ability to manually operate and/or monitor in the control room: APRM back panel switches, meters and indicating lights.

Proposed Question: Common 19



The plant is operating at rated power. APRM 'E' has 5 LPRMs bypassed, APRM 'F' has 5 LPRMs bypassed. All other LPRM inputs are operable.

Which one of the following describes how to use the APRM back panel drawer controls to determine the number of non-bypassed LPRMs and what would their respective meters indicate?

A. Place the respective APRM Meter Function Switch to COUNT.
APRM 'E' meter will indicate 80 on the 0-125% scale.
APRM 'F' meter will indicate 85 on the 0-125% scale.

B. Place the respective APRM Meter Function Switch to COUNT.
APRM 'E' meter will indicate 85 on the 0-125% scale.
APRM 'F' meter will indicate 85 on the 0-125% scale.

C. Place the respective APRM Mode Switch to STANDBY then Place the Meter Function Switch to COUNT.
APRM 'E' meter will indicate 85 on the 0-125% scale.
APRM 'F' meter will indicate 85 on the 0-125% scale.

D. Place the respective APRM Mode Switch to STANDBY then Place the Meter Function Switch to COUNT.
APRM 'E' meter will indicate 85 on the 0-125% scale.
APRM 'F' meter will indicate 80 on the 0-125% scale.

Proposed Answer: A

Explanation (Optional): IAW APRM LP NOH04APRM00C-04

To determine the # of nonbypassed LPRMs on the meter function switch is moved to count

APRM 'E' has 21 LPRM inputs, if 5 are bypassed then 16 remain. Each nonbypassed LPRM is = to 5% on the meter when it is taken to count. Therefore the meter would indicate 80 for APRM 'E'.
APRM 'F' has 22 LPRM inputs, if 5 are bypassed then 17 remain. Each nonbypassed LPRM is = to 5% on the meter when it is taken to count. Therefore the meter would indicate 85 for APRM 'F'.

A. Correct.

B. Incorrect. E would indicate 80, F-85.
C. Incorrect. Only the meter function switch must be moved
D. Incorrect. Only the meter function switch must be moved. E would indicate 80, F-85.

Technical Reference(s) NOH04APRM00C-04 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: LPRM00E005 (As available)

Question Source: Bank # ____
Modified Bank # ____ (Note changes or attach parent)
New X

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge ____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Bigger picture?

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	*2*	
	Group #	1	
	K/A #	400000 A4.01	
	Importance Rating	3.1	

Ability to manually operate and/or monitor in the control room: CCW indications and control.

Proposed Question: Common 20

Plant conditions are as follows:

- Power is 87%
- " A SACS Loop is supplying TACS.
- "D" SACS pump is operating in the "B" SACS Loop.
- "B" SACS pump is in AUTO.
- " A , "C" and "D" Service Water pumps are running.
- "B" Service Water pump is in AUTO.

I&C testing causes an inadvertent LOCA signal generation on "C" Core Spray logic. At the same time, an infeed undervoltage trip of the 40308 breaker occurs. All systems responded as designed.

With NO operator action, what will be the final alignment of SACS, TACS and Service Water?

A. " A SACS Loop is supplying TACS.
" A , "C" and "D" Service Water pumps are running.

B. " A SACS Loop is supplying TACS.
" A , "B" and "D" Service Water pumps are running.

C. "B" SACS Loop is supplying TACS.
" A , "C" and "D" Service Water pumps are running.

D. "B" SACS Loop is supplying TACS.
" A , "B" and "D" Service Water pumps are running.

Proposed Answer: C

Explanation (Optional): IAW HC.OP-SO.EG-0001 section 3.3.8, HC.OP-SO.EA-0001 section 3.3.1, Loss of Normal supply to 10A403 bus requires transfer to alternate supply 40301 from 1BX501 transformer, this is a dead bus transfer "C" SSW will trip and will start on the LOCA sequencer.

C. Correct - Loss of Normal supply to 10A403 bus requires transfer to alternate supply 40301 from 1BX501 transformer, this is a dead bus transfer "C" SSW will trip and will re-start on the LOCA sequencer. Loss of "C" SACS pump will cause a swap of TACS to the B loop. HC.OP-SO.EG-0001, section 3.3.8 "C" channel TACS isolations 2522C/2496C close on LOCA Level 1 signal. This causes a swap to B loop for supply to TACS on low flow.

A. Incorrect - TACS isolations 2522C/2496C close on LOCA Level 1 signal. This causes a swap to B loop for supply to TACS on low flow.

B. Incorrect - TACS isolations 2522C/2496C close on LOCA Level 1 signal. This causes a swap to opposite loop for supply to TACS on low flow. The "B" SW pump will NOT start except for a low flow signal in the associated loop, which did NOT occur.

D. Incorrect - The "B" SW pump will not start except for a low flow signal in the associated loop, which did not occur.

Technical Reference(s): HC.OP-SO.EG-0001 section 3.3.8, HC.OP-SO.EA-0001 section 3.3.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: SERWATE006 (As available)

Question Source: Bank # 56921
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	218000 G2.2.25	
	Importance Rating	3.2	

Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (ADS)

Proposed Question: Common 21

The ADS Technical Specification LCO is based on ensuring the ability of ADS to provide a backup to __(1)__ during a __(2)__ break LOCA.

A. (1) RCIC
(2) Small

B. (1) HPCI
(2) Small

C. (1) RCIC
(2) Large

D. (1) HPCI
(2) Large

Proposed Answer: B

Explanation (Optional):

B. Correct – TS bases 3.5.F. ADS serves as a backup to HPCI during a small break LOCA accident.

A. Incorrect – HPCI not RCIC.
C. Incorrect – HPCI not RCIC, Small not Large.
D. Incorrect – Small not Large Break LOCA.

Technical Reference(s) TS Bases 3.5.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ADSSYSE006 (As available)

Question Source: Bank # WTS 2006
Modified Bank # _____ (Note changes or attach parent)

New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	239002 G2.4.31	
	Importance Rating	4.2	

Emergency Procedures / Plan: Knowledge of annunciator alarms, indications, or response procedures. (SRV)

Proposed Question: Common 22

The plant is operating at 80% power, with the following:

- Reactor water level is +35 inches

Then, an SRV inadvertently opens.

Which one of the following describes the initial Reactor Water level response and what actions are required IAW AB.RPV-0006 "Safety Relief Valve?

A. RPV level will initially rise.
If the SRV CANNOT be closed, within two (2) minutes trip the recirculation pumps and lock the mode switch in Shutdown.

B. RPV level will initially rise.
If the SRV CANNOT be closed, within two (2) minutes reduce the recirculation pumps to minimum and lock the mode switch in Shutdown.

C. RPV level will initially lower.
If the SRV CANNOT be closed, within two (2) minutes trip the recirculation pumps and lock the mode switch in Shutdown.

D. RPV level will initially lower.
If the SRV CANNOT be closed, within two (2) minutes reduce the recirculation pumps to minimum and lock the mode switch in Shutdown.

Proposed Answer: B

Explanation (Optional):

B. Correct – IAW AB.RPV-0006 – IF within 2 minutes the SRV fails to close, reduce the recirculation pumps to minimum and lock the mode switch in Shutdown. RPV Swells up on the RPV pressure reduction when the SRV initially opens.

A. Incorrect. The recirc pumps are to be reduced to minimum, not tripped.

C. Incorrect. RPV Level will rise. The recirc pumps are to be reduced to minimum, not tripped.

D. Incorrect. RPV Level will rise

Technical Reference(s) AB.RPV-0006 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ABRPV4E004 (As available)

Question Source: Bank #
Modified Bank # 22077 (Note changes or attach parent)
New

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Stem editorial

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	203000 A4.02	
	Importance Rating	4.1	

Ability to manually operate and/or monitor in the control room (RHR/LPCI Injection Mode): System valves.

Proposed Question: Common 23

Given the following conditions:

- Reactor power 85%
- " A RHR loop in full flow test mode at 10450 gpm flow

Then, a LOCA occurs resulting in the following:

- Drywell pressure is 4.5 psig increasing
- 5 minutes has elapsed since the LOCA
- Reactor pressure is now 500 psig and lowering

Assuming NO operator action, what is the current status of the following " A RHR Loop valves?

- LPCI injection valve (BC-HV-F017A)
- Test Valve (BC-HV-F024A)
- HX Bypass valve (BC-HV-F048A)

A. (BC-HV-F017A) - open
(BC-HV-F024A) - open
(BC-HV-F048A) - closed

B. (BC-HV-F017A) - open
(BC-HV-F024A) - closed
(BC-HV-F048A) - closed

C. (BC-HV-F017A) - closed
(BC-HV-F024A) - open
(BC-HV-F048A) - open

D. (BC-HV-F017A) - closed
(BC-HV-F024A) - closed
(BC-HV-F048A) - open

Proposed Answer: D

Explanation (Optional): IAW HC.OP-SO.BC-0001

When a LPCI signal is received, the system aligns for RPV injection.

F048 - Receives an open signal for 3 min
F017 - Opens when RPV pressure drops below 450 psig
F024 - Receives a close signal but can be overridden
D. Correct.

A. Incorrect. F017A will still be closed, F024A will be closed, F048A will be open
B. Incorrect. F017A will still be closed, F048A will be open
C. Incorrect. F024A will be closed

Technical Reference(s) HC.OP-SO.BC-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RHRSYSE014 (As available)

Question Source: Bank # 56220
Modified Bank # ____ (Note changes or attach parent)
New ____

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge ____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Stem editorial

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	209001 K4.09	
	Importance Rating	3.3	

Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) and/or interlocks which provide for the following: Load Sequencing

Proposed Question: Common 24

Given the following conditions:

- Drywell pressure increased to *2* psig.
- Off-site power is lost.

Which one of the following describes the start sequence for the core spray systems after off-site power was lost?

A. Core Spray pumps " A , "B", "C", and "D" start six seconds after the diesel generator output breaker is closed.

B. Core Spray pumps " A , "B", "C", and "D" start immediately after the diesel generator output breakers are closed.

C. Core Spray pumps " A and "C" start immediately after the diesel generator output breaker is closed. Core Spray pumps "B" and "D" start six seconds after the diesel generator output breakers are closed.

D. Core Spray pumps "A" and "B" start immediately after the diesel generator output breakers are closed. Core Spray pumps "C" and "D" start six seconds after the diesel generator output breakers are closed.

Proposed Answer: A

Explanation (Optional): IAW HC.OP-SO.BE-0001

A. Correct - Core Spray pumps " A , "B", "C", and "D" start six seconds after the diesel generator output breaker is closed. - With a LOP, all pumps start 6 seconds after the edg output breaker closed.

B. lncorrect - They all start 6 seconds after diesel generator output breaker closes.
C. lncorrect – They all start 6 seconds after diesel generator output breaker closes.
D. lncorrect - They all start 6 seconds after diesel generator output breaker closes.

Technical Reference(s) HC.OP-SO.BE-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: CSSYS0E005 (As available)

Question Source: Bank # 80663
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	259002 K5.03	
	Importance Rating	3.1	

Knowledge of the operational implications of the following concepts as they apply to REACTOR WATER LEVEL CONTROL SYSTEM : Water level measurement.

Proposed Question: Common 25

Given the following:

- The plant is at 85% power
- All three Reactor Feed Pumps are in Auto
- RPV Narrow Range Level instruments indicate:
  - N004A = 34 inches
  - N004B = 35 inches
  - N004C = 35.5 inches

Which of the following describes the plant response to actual Reactor water level if a slow leak developed through the N004B detector equalizing valve eventually causing a gross failure of N004B?

Actual Reactor water level would.

A. lower 1 inch, then rise 0.5 inches.

B. rise 1 inch, then lower 0.5 inches.

C. lower 0.5 inch, then rise 1.5 inches.

D. rise 0.5 inch, then lower 1.5 inches.

Proposed Answer: C

Explanation (Optional): C. Correct

C. CORRECT - lower 0.5 inch, then rise 1.5 inches. initially N004B is selected since DFCS selects the MEDIAN RPV level signal when three good signals are available. With a leak through the N004B equalizing valve, N004B INDICATED level would begin to rise, resulting in a lowering of ACTUAL RPV level. As soon as N004B exceeded 35.5 inches INDICATED, N004C would become the MEDIAN RPV level signal. ACTUAL RPV level would have lowered 1/2 inch during this transition. When N004B gross fails, N004A (the lowest of the two remaining signals) will become the controlling level signal. RPV water

level will then rise since INDICATED level on N004A is 34 inches. This is a 1.5 inch rise from the previous level.

IAW FW Control Lesson Plan, Pane 18 - On a failure of a narrow range Rosemount Level Detector (PDT-N004A, B or C) with the feedwater system in automatic three-element control from the Master Level Controller, level stays near its setpoint since the level signal is now the lower of the two good remaining level inputs. If another level transmitter were to fail, the remaining signal is now the controlling signal.

A. INCORRECT - lower 1 inch, then rise 0.5 inches. Level initially lowers by 1/2 inch.
B. INCORRECT - rise 1 inch, then lower 0.5 inches. Level initially lowers.
D. INCORRECT - rise 0.5 inch, then lower 1.5 inches. Level initially lowers.

Technical Reference(s): Engineering Drawing H-1-AE-ECS-0128-0; FW Control LP - NOH04FWCONTC-04 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: FWCONTE001 (As available)

Question Source: Bank # 53240; Modified Bank # ____ (Note changes or attach parent); New ____

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge ____; Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	261000 A3.02	
	Importance Rating	3.2	

Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: Fan start

Proposed Question: Common 26

Given the following:

- The plant is operating at full power
- A Loss of Offsite power occurs
- Drywell pressure is 3.3 psig and rising
- " A Emergency Diesel Generator fails to start
- " A FRVS Vent Fan is in Auto Lead
- "B" FRVS Vent Fan is in Auto

Which one of the following describes the status of FRVS 2 minutes after the LOCA sequencers actuate?
(Assume NO operator action)

A. Only 3 Recirc Fans and NO Vent Fans start

B. Only 3 Recirc Fans and ONE Vent Fan start

C. Only 4 Recirc Fans and NO Vent Fans start

D. Only 4 Recirc Fans and ONE Vent Fan start

Proposed Answer: D

Explanation (Optional): D. Correct – Loss of power to " A Bus will prevent the " A and "E" Recirc fan from starting. The "F" Recirc fan will not start until 30 seconds after the LOCA sequencer actuates. The " A vent fan has no power and the "B" will start after 45 second time delay. The B fan has a flow sensor in the A ductwork.

IAWHC.OP-SO.GU-0001 - FRVS Recirculation Fans AV213 through FV213 in AUTO and FRVS Vent Fan in AUTO LEAD will automatically start under any of the
following conditions:

High Drywell Pressure (1.68 psig).
• Low RPV Water Level (Level 2, - 38").
• Refueling Floor Exhaust Duct High Radiation
• Reactor Building Exhaust Air High Radiation

D. Correct.

A. Incorrect. B vent fan will be running.
B. Incorrect. 4 recirc fans start.
C. Incorrect. Only 3 recirc fans running and B recirc fan

Technical Reference(s) HC.OP-SO.GU-0001 (Attach if not previously provided)
LPNOHO'I RBVENTC-00

Proposed references to be provided to applicants during examination: none

Learning Objective: RBVENTE006 (As available)

Question Source: Bank # ____
Modified Bank # ____ (Note changes or attach parent)
New X

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge ____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	201003 K1.01	
	Importance Rating	3.2	

Knowledge of the physical connections and/or cause-effect relationships between CONTROL ROD AND DRIVE MECHANISM and the following: CRD Hydraulic system

Proposed Question: Common 27

Which one of the following describes scram valve response and indication on the full core display following a reactor scram?

A. The scram inlet valve opens faster than the scram outlet valve.
The blue scram light will be illuminated as soon as the scram inlet valve is fully open.

B. The scram outlet valve opens faster than the scram inlet valve.
The blue scram light will be illuminated as soon as the scram outlet valve is fully open.

C. The scram inlet valve opens faster than the scram outlet valve.
The blue scram light will be illuminated when both scram inlet AND outlet valves are fully open.

D. The scram outlet valve opens faster than the scram inlet valve.
The blue scram light will be illuminated when both scram inlet AND outlet valves are fully open.

Proposed Answer: D

Explanation (Optional): IAW CRD Lesson Plan NOH04CRDHYD-04 Section 1O.h. & 10.g.3) - Scram Outlet Valve (XV-127) - fast acting globe valve that is opened by an internal spring and which exhausts water from the top of the drive piston. The scram outlet valve opens faster than the scram inlet valve because of a stronger spring and more rapid venting. A position indicator switch on the valve energizes a blue light on the Control Room panel 10C650C when the scram inlet and outlet valves are open.

D. Correct.

A. Incorrect – The scram light requires both valves open. The outlet valve opens faster.
B. Incorrect – The scram light requires both valves open
C. Incorrect – The outlet valve opens faster. The light will not illuminate unless both valves are open

Technical Reference(s) Lesson plan NOH04CRDHYD-04 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: CRDHYDE025 (As available)

Question Source:
Bank #
Modified Bank # (Note changes or attach parent)
New X

Question History: Last NRC Exam

Question Cognitive Level:
Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	226001 A3.01	
	Importance Rating	3.0	

Ability to monitor automatic operations of the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE including: Valve operation

Proposed Question: Common 28

A LOCA has occurred and the following conditions exist.

- Reactor is scrammed
- Drywell Pressure is 10.4 psig and rising
- RHR Loop "A" is injecting to the RPV
- RHR Loop "B" is in Torus Spray

Which one of the following describes how RHR Containment Spray Isolation Valves BC-HV-F016A(B) and BC-HV-F021A(B) logic would function under these conditions?

A. NO valves could be opened simultaneously

B. ONLY the F016A & F021A could be opened simultaneously

C. ONLY the F016B & F021B could be opened simultaneously

D. BOTH the F016A & F021A and the F016B & F021B could be opened simultaneously

Proposed Answer: C

Explanation (Optional): C. Correct

IAW RHR Lesson Plan NOHO'I RHRSYSC-06, Section IV.A.14.b. Page 43 - FOI6A(B) and F021A(B) are interlocked such that both valves can only be opened simultaneously when: There is a LPCI initiation signal present AND High drywell pressure condition exists AND F017A(B) IS 100% CLOSED.

In this case, a LPCI initiation signal is present and high drywell pressure exists. With the F017A is open and therefore the F016A &F021A cannot be opened simultaneously. With RHR loop "B" in Torus Cooling, the F017B is closed, therefore, the F016B & F021B can be opened simultaneously.

A. Incorrect. - The B loop valves can be opened simultaneously
B. Incorrect. – ONLY the B loop valves can be opened simultaneously
D. Incorrect - ONLY the B loop valves can be opened simultaneously

Technical Reference(s) RHR Lesson Plan NOHO1RHRSYSC-06 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RHRSYSE011 (As available)

Question Source:
Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	234000 K3.03	
	Importance Rating	3.1	

Knowledge of the effect that a loss or malfunction of the FUEL HANDLING EQUIPMENT will have on following: Fuel handling operations.

Proposed Question: Common 29

The plant is in a refueling outage with the following conditions.

- Mode Switch in REFUEL
- All Control Rods are full in
- Refuel Platform over the core
- Fuel grapple is being raised carrying a fuel bundle
- Monorail Auxiliary Hoist is loaded with a Fuel Support Piece

Then, the Refuel Bridge System "Rods Out Relay" contact fails indicating all rods are NOT full in.

Which one of the following describes the effect of the failed contact on fuel handling operations?

A. Monorail Auxiliary Hoist raise and lower motion is prevented.

B. ONLY Monorail Auxiliary Hoist lower motion is prevented.

C. ONLY Main Hoist lower motion is prevented.

D. Main Hoist raise and lower motion is prevented.

Proposed Answer: D

Explanation (Optional): IAW Refueling lesson plan NOHO1 REFUEL-03 Table 2, first page.

D. Correct – with the system "seeing" one rod out with the platform over the vessel, no motion is permitted. The Monorail Auxiliary Hoist is not affected by the Rods Out Relay Contact

A. Incorrect – The Monorail Auxiliary Hoist is not affected by the Rods Out Relay Contact.
B. Incorrect - The Monorail Auxiliary Hoist is not affected by the Rods Out Relay Contact
C. Incorrect - ALL motion is prevented due to the system "seeing" one rod out.

Technical Reference(s) NOHO1 REFUEL-03 Table 2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: REFUELE005 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments:
Change A distractor maybe take Main Hoist out of stem

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	214000 K4.01	
	Importance Rating	3.0	

Knowledge of (ROD POSITION INFORMATION SYSTEM) design feature(~) and or interlocks which provide for the following: Reed switch locations

Proposed Question: Common 30

The control rod reed switches are designed to illuminate a Full Core Display amber DRIFT indicator under which one of the following conditions?

NO rod motion command present and…

A. ONLY an odd reed switch closed.

B. ONLY an even reed switch closed.

C. an odd AND even reed switch closed.

D. the ROD DRIFT TEST PB is depressed.

Proposed Answer: A

Explanation (Optional): IAW HC.OP-SO.SF-0001, Att.6 Section B.2. – ROD DRIFT a control rod is changing position with no command signal or the ROD DRIFT TEST PB pressed while a rod is being moved (amber).

A. Correct -see HC.OP-SO.SF-0001 attachment # 6

B. Incorrect - requires odd reed switch without rod motion command signal.
C. Incorrect - requires odd reed switch without rod motion command signal.
D. Incorrect - Rod motion must be present

Technical Reference(s) HC.OP-SO.SF-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: MANCONE002 (As available)

Question Source: Bank # 54400

Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

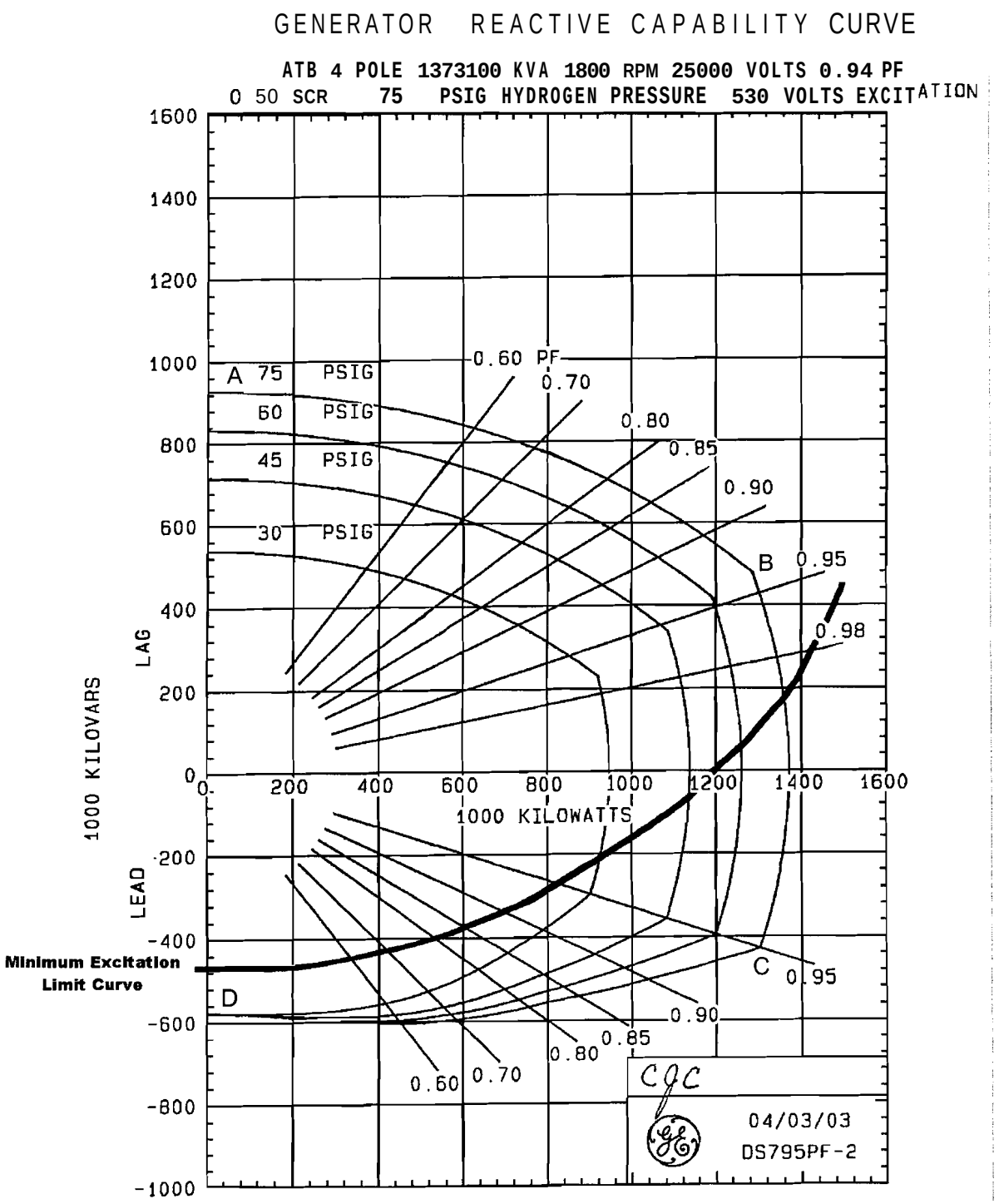
10 CFR Part 55 Content: 55.41 X
_____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	WA #	245000 K5.07	
	Importance Rating	2.6	

Knowledge of the operational implications of the following concepts as they apply to MAIN TURBINE GENERATOR AND AUXILIARIES SYTEMS: Generator operations and limitations

Proposed Question: Common 31



CURVE AB LIMITED BY FIELD HEATING
CURVE BC LIMITED BY ARMATURE HEATING
CURVE CD LIMITED BY ARMATURE CORE END HEATING

GENERATOR REACTIVE CURRENT CAPABILITY CURVE

VDrive\Drawings\1000\Av1561l vsd Rev 9

Given the attached Generator Capability Curve and the following information:

- Hydrogen Pressure 65 psig
- Generator MVARS LAG = 200
- MWatts = 1290

The load dispatcher requests increasing MVARS from 200 to 400.

Determine what, if any, curve limitation will be exceeded if the MVARS are INCREASED as requested.

A. NO curve limitation will be exceeded.

B. The curve limitation for Field heating will be exceeded.

C. The curve limitation for Armature heating will be exceeded.

D. The curve limitation for Armature Core End heating will be exceeded.

Proposed Answer: C.

Explanation (Optional): Per the curve (see markup), the region for Armature Heating would be exceeded (BC region)

Technical Reference(s) Gen Capability curve (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: MNGEN0E009 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments: Stem editorial

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	204000 K6.08	
	Importance Rating	3.5	

Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER CLEANUP SYSTEM: PCISINSSSS.

Proposed Question: Common 32

The plant is operating at full power when an I&C surveillance inadvertently causes a loss of power to the 120VAC RPS Bus "A.

Which one of the following describes the effect of the loss, if any, on the Reactor Water Cleanup system valve(s)?

A. NO effect.

B. ONLY RWCU PMP SUCT CONT INBD ISOLATION VALVE BG-HV-F001 will close.

C. ONLY RWCU PMP SUCT CONT OUTBD ISOLATION VALVE BG-HV-F004 will close.

D. RWCU PMP SUCT CONT INBD ISOLATION VALVE BG-HV-F001 will close.
RWCU PMP SUCT CONT OUTBD ISOLATION VALVE BG-HV-F004 will close.

Proposed Answer: B

Explanation (Optional): IAW RWCU Lesson Plan NOHO4RWCU00C-01 – Section III.B.3.b.5) - A loss of power to a channel of the (NS4) Leak Detection System will cause the respective valve to isolate. The power supplies are 120 VAC RPS Bus A for channel A (NS4) (shuts F001) and 120 VAC RPS Bus B for channel D (NS4) (shuts F004).

B. Correct

A. Incorrect. - The FOOI will shut.
C. Incorrect. – The F004 will remain open
D. Incorrect – The F004 will remain open

Technical Reference(s) RWCU Lesson Plan NOHO4RWCU00C-01 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RWCU00E013 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
Editorial in stem

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	WA #	201001 A1.10	
	Importance Rating	2.8	

Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROD DRIVE HYDRAULIC SYSTEM controls including: CRD cooling water flow.

Proposed Question: Common 33

Given the following conditions:

- Reactor operating at 100% rated power
- CRD flow control valve in automatic
- The RO throttles closed on the Pressure Control Valve (BF-HV-F003) for two seconds

Which one of the following describes how parameters will stabilize when this CRD system transient is over?

A. Differential pressure between the Drive Water Header and the RPV will lower Cooling water flow will lower.

B. Differential pressure between the Drive Water Header and the RPV will rise. Cooling water flow will lower.

C. Differential pressure between the Drive Water Header and the RPV will lower. Cooling water flow will remain the same.

D. Differential pressure between the Drive Water Header and the RPV will rise. Cooling water flow will remain the same.

Proposed Answer: D

Explanation (Optional): IAW CRD Lesson Plan NOH04CRDHYD-04, Section II.B.6, page 21 - The motor-operated PCV is positioned to maintain approximately 265 psid between drive water header pressure and reactor pressure (senses above core plate pressure). To RAISE the differential pressure between the drive water header and the RPV, press the DECREASE PB to cause the motor-operated PCV to travel in the closed direction

Throttling the drive water pressure control valve closed will increase pressure in the line. Cooling water flow will be unaffected due to a different flowpath from the system pumps(see P&ID M-46-1)

D. Correct.

A. Incorrect. D/P will rise. Cooling water flow will be constant
B. Incorrect. Cooling water flow will be constant
C. Incorrect. – D/P will rise

Technical Reference(s) P&ID M-46-1 (Attach if not previously provided)
CRD Lesson Plan
NOH04CRDHYD-04

Proposed references to be provided to applicants during examination: None

Learning Objective: CRDHYD0E006 (As available)

Question Source: Bank # 56276
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X
_____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	WA #	239001 A2.12	
	Importance Rating	4.2	

Ability to (a) predict the impacts of the following on the MAIN AND REHEAT STEAM SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: PCIS/NSSSS actuation.

Proposed Question: Common 34

The plant is in OPCON 4 with the following conditions:

- Mode Switch is in SHUTDOWN
- All RPS Channels are reset
- Main Condenser Pressure is 30" HgA
- Main Turbine is tripped
- All MSIVs are open

Then, NSSSS channels A and B inadvertently actuate.

The cause of the isolation signal has been cleared.

Which one of the following describes the response of the MSIVs when NSSSS actuated and what actions must now be taken to reopen an MSIV that had closed IAW HC.OP-SO.SM-0001?

A. ONLY the Inboard MSIVs CLOSE.
The MSIV control switches must be placed in the CLOSED position then the NSSSS LOGIC RESET PBs must be depressed.

B. ONLY the Inboard MSIVs CLOSE.
The NSSSS LOGIC RESET PBs must be depressed then the MSIV control switches must be placed in the CLOSED position.

C. All MSIVs CLOSE.
The MSIV control switches must be placed in the CLOSED position then the NSSSS LOGIC RESET PBs must be depressed.

D. All MSIVs CLOSE.
The NSSSS LOGIC RESET PBs must be depressed then the MSIV control switches must be placed in the CLOSED position.

Proposed Answer: C

Explanation (Optional): C. Correct

IAW NSSSS Lesson Plan NOH04NSSSSOC-02 - All MSIV control switches must be in

"CLOSE" to enable reset of the isolation. This prevents automatic reopening of the MSIVs following isolation reset. The initiating condition must have cleared to reset the isolation logic.

NSSSS Channels A or C and B or D must trip to close the MSIV.

A. Incorrect. All MSIVs close
B. Incorrect. All MSIVs close. The MSIV control switches must be placed in CLOSE first
A. Incorrect. The MSIV control switches must be placed in CLOSE first

Technical Reference(s) NOH04NSSSSOC-02 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: MSSTEAME012 (As available)

Question Source: Bank #
Modified Bank # (Note changes or attach parent)
New X

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	215002 A3.01	
	Importance Rating	3.1	

Ability to monitor automatic operations of the ROD BLOCK MONITOR SYSTEM including: Four rod display: BWR-3,4,5.

Proposed Question: Common 35

Given the following conditions:

- The plant is operating at 100% power
- 1\10 LPRMs are bypassed
- Control Rod 30-31 is selected and is at notch position 10

Then, Rod Block Monitor Channel B is bypassed with the joystick.

Which of the following describes the effect on the FOUR ROD DISPLAY indication?

A. NO LPRM BYPASSED lights are illuminated.

B. All LPRM BYPASSED lights are illuminated.

C. ONLY the B and D level LPRM BYPASSED lights are illuminated.

D. ONLY the B level LPRM BYPASSED lights are illuminated.

Proposed Answer: C

Explanation (Optional):

C - Correct

IAW RBM Lesson plan NOH04RBMSYS-00, Page 29,30 – Section IV.A.2.b. - The amber LPRM level A/B/C/D BYPASSED lights (on the Four Rod Display) illuminate when any of the following conditions exist: The RBM BYPASS switch is in either the CH. A or CH. B position *(only* the BYPASSED lights for the LPRM detectors associated with the RBM channel will illuminate. RBM channel A: only the A and C level LPRM detector BYPASSED lights will illuminate. RBM channel B: only the B and D level LPRM detector BYPASSED lights will illuminate)

A. Incorrect. The B and D lights will illuminate
B. Incorrect. ONLY the B and D lights will illuminate
D. Incorrect. The D lights will also illuminate

Technical Reference(s) NOH04RBMSYS-00 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: LPRM00E002 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments: editorial in stem

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	241000 A4.07	
	Importance Rating	3.5	

Ability to manually operate and/or monitor in the control room: Main stop/throttle valves (operation).

Proposed Question: Common 36

Given the following conditions:

- The Main Turbine is reset.
- As part of the Main Turbine Startup, the RO has depressed the CONTROL, PRE-WARMING~SHELL WARMING ON, on the DEHC HMI.

Which of the following directly occurs as a result of these actions?
(Assume VPL Limiter is at its normal setting of 100%)

A. Intercept Valves OPEN AND Turbine Stop Valves OPEN

B. Turbine Stop Valves OPEN AND Turbine Control Valves CLOSE

C. Turbine Control Valves OPEN AND Intermediate Stop Valves CLOSE

D. Intermediate Stop Valves OPEN AND Intercept Valves CLOSE

Proposed Answer: C

Explanation (Optional): C. Correct

IAW HC.OP-AC-0001 step 5.2.7, The Control Valves OPEN, all others close or go closed.

Shell warming is initiated by depressing the CHEST-SHELL WARMING SHELL pushbutton. This opens the Turbine Control Valves and the pilot valve to the #2 Turbine Stop Valve. The stop valves remain closed. Intermediate Stop Valves are open on reset and go closed. The Intercept Valves remain closed.

A. Incorrect. IVs and TSPs remain closed
B. Incorrect. Turbine Stop Valves remain closed. TCVs Open
D. Incorrect. ISVs go closed. IVs stay Closed

Technical Reference(s) HC.OP-AC-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: MNTURBE024 (As available)

Question Source: Bank # 62008
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Change distractors to a combination of valves

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	223001 G2.2.39	
	Importance Rating	3.4	

Equipment Control: Knowledge of less than or equal to one hour Technical Specifications for a system (Primary Cont)

Proposed Question: Common 37

The plant is operating at 75% power and you note the following readings while taking logs at the start of your shift:

- Drywell average temperature is 137 degrees F
- Drywell Pressure is 1.2 psig.
- Suppression Pool water level is 74 inches.

Which of the following must be restored to within Technical Specifications limits within ONE hour to preclude further actions?

A. Suppression Pool Level ONLY.

B. Suppression Pool Level AND Drywell Pressure ONLY.

C. Drywell Average Temperature AND Suppression Pool Level ONLY.

D. Drywell Average Temperature AND Suppression Pool Level AND Drywell Pressure.

Proposed Answer: A

Explanation (Optional):

A. Correct

IAW TS 3.6.2.1 - The suppression chamber shall be OPERABLE: With an indicated water level between 74.5" and 78.5". Per Action a) With the suppression chamber water level outside the above limits, restore the water level to within the limits within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

B. Incorrect. - Action is required within 1 hour if DW pressure exceeds 1.5 psig

C. Incorrect. - Action is required in 8 hours for exceeding Drywell average temperature limits.

D. Incorrect. – Action is required in 8 hours for exceeding Drywell average temperature limits.

Technical Reference(s) TS 3.6.2.1, 3.6.1.7, 3.6.1.6 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: PRICONE009 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	259001 A1.06	
	Importance Rating	2.7	

Ability to predict and/or monitor changes in parameters associated with operating the REACTOR FEEDWATER SYSTEM controls including: Feedwater heater level.

Proposed Question: Common 38

The plant is at full power when the operators notice an increasing shell level in the 2A Feedwater Heater (FWH).

An operator is sent out to the local panel to operate FWH 2A drain valve manually. Then the Hi-Hi shell level setpoint is reached for the 2A FWH.

Which one of the following describes how the 2A FWH is affected?

A. Extraction steam to the heater is isolated AND condensate flow through the heater tube side is isolated.

B. Condensate flow through the heater tube side is isolated. NO other automatic actions occur.

C. Extraction steam to the heater is isolated AND the cascading drain flow from the 3A FWH is isolated.

D. Condensate flow through the heater tube side is isolated AND the cascading drain flow from the 3A FWH is isolated.

Proposed Answer: D

Explanation (Optional): D. Correct

IAW FWH Lesson Plan NOH04FWHEATC-01 Section III.C.2.b)- Page 32, If the "Hi-Hi" setpoint is reached, the following actions will occur: [For the 1,2 (A, B, C) only, the isolation will occur after a ten second time delay once the Hi-Hi level is reached]

- FWHTR's 1,2 (A, B, C) - Condensate flow through the heater tube side is isolated (this reduces the extraction flow to that heater) AND Cascading drains from heater 3 (A, B, C) are isolated

A. Incorrect – no extraction steam isolation
B. Incorrect – Also, cascading drain flow from the 3A FWH is isolated.
D. Incorrect – no extraction steam isolation

Technical Reference(s) NOH04-FWHEATC-01 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: FWHEATE008 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments:
Editorial changes in stem and distractor " A

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295018 AK1.01	
	Importance Rating	3.5	

Knowledge of the operational implications of the following wncepts as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Effects on component/system operations.

Proposed Question: Common 39

Given the following:

- The plant is operating at 100% reactor power.
  " A SACS Loop is supplying TACS with " A & "C" SACS Pumps running.
- "D" SACS Pump is running supplying the "B" SACS Loop loads.
- A trip of the " A SACS Pump has occurred.
- The "C" SACS Pump remains running.
- The idle "B" SACS Pump has auto started.

Which one of the following describes the affects, if any, on the SACS/TACS system? (assume NO operator action)

SACS/TACS Isolation valves, EG-HV-2522A __(1)__ and EG-HV-2522C __(2)__

A. (1) CLOSES
   (2) CLOSES

B. (I) remains OPEN
   (2) remains OPEN

C. (1) remains OPEN
   (2) CLOSES

D. (1) CLOSES
   (2) remains OPEN

Proposed Answer: D

Explanation (Optional): D. Correct IAW HC.OP-SO.EG-0001interlocks section

D. Correct - " A valve receives a close signal from the " A pump stop input. The "C" valve does not close because the "C" pump is still running.

A. Incorrect - The "C" valve does not close because the "C" pump is still running.

B. Incorrect – "A" valve receives a close signal from the " A pump stop input
C. Incorrect - " A valve receives a close signal from the " A pump stop input. The "C" valve does not close because the "C" pump is still running.

Technical Reference(s) HC.OP-SO.EG-0001interlocks section (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: STACS0E018 (As available)

Question Source: Bank # 55907
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295006 AK1.03	
	Importance Rating	3.7	

Knowledge of the operational implications of the following concepts as they apply to SCRAM : Reactivity control.

Proposed Question: Common 40

What are the operational implications of RPS having a built in time delay of 10 seconds before allowing a SCRAM to be manually reset?

A. To ensure all the control rods fully insert.

B. To allow the Scram Air header to repressurize.

C. To allow Rod Worth Minimizer to determine shutdown status.

D. To ensure the Scram Discharge Volume vent and drain valves are fully closed.

Proposed Answer: A

Explanation (Optional): IAW RPS Lesson Plan NOH01RPSOOC-05, Page 37, Section E.6. - Manual reset of a full scram is inhibited for 10 seconds after initiation to ensure control rods drive to FULL IN position.

A. Correct.

B. Incorrect. Not the reason cited in Lesson plan

C. Incorrect. Not the reason cited in Lesson plan

D. Incorrect. Not the reason cited in Lesson plan

Technical Reference(s) NOH01RPSOOC-05 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RPS000E007 (As available)

Question Source: Bank # 68852

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam 2002

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

Comments:
New distractor "C"

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295001 AK1.02	
	Importance Rating	3.3	

Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Power/flow distribution.

Proposed Question: Common 41

Plant conditions are as follows:

- Initially the reactor is at 96.9% power with both Recirculation loops in operation.
- OPRMs are inoperable.

Following a lightning strike event and various power losses, core flow and power are reduced.

Actual Core flow is at 40% of rated and steady.

- Reactor power is 40% and slowly rising.
- APRM Recorders are currently reading <1% peak-to-peak oscillations.

If flow remains at 40%, which of the following is the highest power level at which the mode switch may remain in RUN?

A. 44%

B. 47%

C. 50%

D. 56%

Proposed Answer: C.

Explanation (Optional):

C. Correct - Region 1 of the current MELLA OPRM INOP power to flow map has 40% core flow cross the curve at 50.4% power

A. Incorrect - 44% if choosing region 2 looks correct - does not require the action
B. Incorrect - Also in region 2 - does not require the action
D. Incorrect - Region 1 but not the lowest value in region 1

Technical Reference(s) IOZZ-0006, Att 1, (Attach if not previously provided)

OP-AB.RPV-0003, pgs 2 and 3 of 41

Proposed references to be provided to applicants during examination: Both Power-to-Flow maps HC-OP. IO-ZZ-0006 Att. 1

Learning Objective: IOP006E004 (As available)

Question Source: Bank # ID: Q81326
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Stem editorial changes

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	700000 AK2.02	
	Importance Rating	3.1	

Knowledge of the interrelations between GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and the following: Breakers, relays.

Proposed Question: Common 42

The plant was operating at full power when the following occurs:

- Generator Differential Overcurrent
- Alternator Exciter Differential Overcurrent
  Generator Negative Phase Sequence

Which one of following describes the response of the plant?

A. Generator output breakers BS6-5 & BS2-6 TRIP.
lsophase Bus Duct Cooling Fans TRIP.
The Main Turbine AND Alterex Exciter Field Breaker are unaffected.

B. The Main Turbine AND Alterex Exciter Field Breaker TRIP.
Generator output breakers BS6-5 & BS2-6 AND
lsophase Bus Duct Cooling Fans are unaffected.

C. Main Turbine, Alterex Exciter Field Breaker AND
Generator output breakers BS6-5 & BS2-6 TRIP.
lsophase Bus Duct Cooling Fans are unaffected.

D. The Main Turbine, Alterex Exciter Field Breaker, Generator output breakers BS6-5 & BS2-6 AND lsophase Bus Duct Cooling Fans ALL TRIP.

Proposed Answer: C

Explanation (Optional):
Generator Differential Overcurrent, Alternator Exciter Differential Overcurrent and Generator Negative Phase Sequence cause a Main Generator regular lockout relay to actuate.

The following automatic actions are initiated when the Main Generator regular lockout relay (86GR) is actuated.

Trips and blocks closing of gen output breakers BS6-5 & BS2-6
Trips the Main Turbine
Trips and blocks the closing of the Alterex Exciter Field Breaker

C. Correct – see above

A. Incorrect – The isophase fans are not interlocked to trip on a generator lockout and the turbine will trip and Alterex Exciter Field Breaker will open.
B. Incorrect - The isophase fans are not interlocked to trip on a generator lockout and the generator output breakers BS6-5 & BS2-6 will trip open.
D. Incorrect - The isophase fans are not interlocked to trip on a generator lockout.

Technical Reference(s) OP-SO.MA-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: MNGEN0E011 (As available)
MNPWR0E019

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments:
Put conditions in stem that would cause the lockout generator to actuate

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295030 EK2.02	
	Importance Rating	3.7	

Knowledge of the interrelations between LOW SUPPRESSION POOL WATER LEVEL and the following: RCIC: Plant-Specific.

Proposed Question: Common 43

IAW HC.OP-EO.ZZ-0313, Emergency Makeup to the Suppression Pool via RCIC is accomplished by….

A. running RCIC with the full flow test flowpath open.

B. running RCIC with the minimum flow discharge flowpath open.

C. overriding and opening both RCIC suction MOV's simultaneously.

D. overriding and opening the Test Return and the Suppression Pool suction MOV's.

Proposed Answer: B

Explanation (Optional):

B. CORRECT - Running RCIC with the min flow discharge flowpath open, IAW EO-ZZ-313.

A. Incorrect. This would only recirculation CST water. No procedural guidance
C. Incorrect - There is a check valve in the Suppression pool suction path to prevent gravity draining the CST into the Suppression pool. No procedural guidance
D. Incorrect - There is a check valve in the Suppression pool suction path to prevent gravity draining the CST into the Suppression pool. No procedural guidance

Technical Reference(s) HC.OP-EO.ZZ-0313 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: EOP300E004 (As available)

Question Source: Bank # 56168
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295004 AK2.01	
	Importance Rating	3.1	

Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF D.C. POWER and the following: Battery charger.

Proposed Question: Common 44

Regarding the battery chargers for the following DC Buses:

- HPCI 250 VDC bus
- 125 VDC bus 10D410

Which one of the following describes how their respective bus power is affected following the loss of their respective charger(s)?

The batteries for the __(1)__ are designed to supply their loads for __(2)__.

	(1)	(2)
A.	250 VDC 125 VDC	2 (two) hours 2 (two) hours
B.	250 VDC 125 VDC	4 (four) hours 4 (four) hours
C.	250 VDC 125 VDC	2 (two) hours 4 (four) hours
D.	250 VDC 125 VDC	4 (four) hours 2 (two) hours

Proposed Answer: B

Explanation (Optional): B. Correct

IAW DC Lesson Plan NOH01DCELEC-01, Page 33. The 250 VDC Class 1E batteries can supply system loads for four (4) hours without the battery chargers in operation. The 125 VDC Class 1E batteries can supply system loads for four (4) hours without the battery chargers in operation. The TS LCO time is 2 hours. TS 3.8.2.1.

A, C, D. Incorrect – All batteries are designed for 4 hours

Technical Reference(s) NOH01DCELEC-01 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: DCELECE015 (As available)

Question Source:
Bank #
Modified Bank # (Note changes or attach parent)
New X

Question History: Last NRC Exam

Question Cognitive Level:
Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295037 AK3.01	
	Importance Rating	3.4	

Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Recirc Pump Trip/Runback

Proposed Question: Common 45

A failure to scram has occurred and reactor power is 65%. The main turbine is on line.

The recirculation pumps are required to be runback to minimum speed before tripping the pumps to…

A. maintain the largest margin to the MCPR limit.

B. prevent an RPV high level trip to ensure HPCI/Core Spray injection flowpath.

C. prevent power instabilities due to operating at high power without adequate core flow.

D. prevent additional heat loading of the torus if power remains above the bypass valve capacity.

Proposed Answer: D

Explanation (Optional): EOP-101A RC/Q-8 bases

The most rapid flow rate reduction and, consequently, the most rapid power reduction, is achieved by tripping the recirculation pumps. However, if the recirculation pump trip is initiated from a high power level, the resulting rapid changes in steam flow, RPV pressure, and RPV water level may cause a trip of the main turbine-generator and a trip of RPV injection systems. If the main turbine-generator trips and reactor power exceeds the turbine bypass valve capacity, RPV pressure will increase until one or more SRVs open. Heatup of the suppression pool then begins and RPV level lowering may be required. If RPV injection systems trip, the resultant RPV water level transient may require emergency depressurization of the RPV and operation of less desirable RPV injection sources.

To effect a more controlled reduction in reactor power and thereby avoid main turbine-generator and RPV injection system trips and their associated complications, a recirculation flow runback is performed prior to tripping the recirculation pumps. If an automatic runback has occurred, the operator need only confirm the action.

D. Correct - prevent additional heat loading of the torus if power remains above the bypass valve capacity

A. Incorrect - maintain the largest margin to the MCPR limit. Removing RPV flow will rely

on natural circulation to prevent approaching the MCPR limit during an ATWS, it will certainly not lessen it

B. Incorrect - In an ATWS condition, HPCI injection through Core Spray flowpath is not desired.

C. Incorrect - prevent power instabilities due to operating at high power without adequate core flow. Actions taken will remove all forced circulation, and lower RPV level to lower power, power takes precedent over instabilities.

Technical Reference(s) EOP-101A bases (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: EO101AE006 (As available)

Question Source: Bank # 56604
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam none

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.4.1 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295026 EK3.04	
	Importance Rating	3.7	

Knowledge of the reasons for the following responses as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: SBLC injection.

Proposed Question: Common 46

EOP 101A steps RCIQ-10 and RC/Q -11 state: Before Suppression Pool temperature reaches 140 degrees F, initiate SLC and verify RWCU isolates.

What is the reason for these EOP steps?

A. It ensures the reactor will be in Cold Shutdown before the Suppression Pool reaches the Heat Capacity Temperature Limit.

B. It ensures the reactor will be in Hot Shutdown before the Suppression Pool reaches the Heat Capacity Temperature Limit.

C. It ensures the reactor will be in Cold Shutdown before the Suppression Pool reaches the Boron Injection Initiation Temperature.

D. It ensures the reactor will be in Hot Shutdown before the Suppression Pool reaches the Boron Injection Initiation Temperature.

Proposed Answer: B.

Explanation (Optional): B. Correct

IAW EOP-101A, step RC/Q-10 bases

A. Incorrect – Hot SID is the bases
C. Incorrect – The (BIIT) is not the bases. HCTL in Hot S/D is the reason.
D. Incorrect - The (BIIT) is not the bases.

Technical Reference(s) EOP-101A bases page 11 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: EO101AE004 (As available)

Question Source: Bank # 53439
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295025 EK3.05	
	Importance Rating	3.6	

Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE: RCIC operation: Plant-Specific.

Proposed Question: Common 47

Ten minutes after a scram, an MSIV Isolation occurs and RCIC is in pressure control augmented by SRVs. RCIC speed is then observed to oscillate with the flow controller in AUTO.

Which of the following explains the RCIC speed oscillations?
(assume NO other operator actions)

A. Swings in RPV pressure are occurring due to the methods being used for pressure control. This causes the RCIC speed to change as the controller maintains a constant flow.

B. In pressure control, the RCIC controller attempts to maintain a constant speed, but CANNOT respond fast enough to maintain speed as the RPV pressure changes.

C. Using RCIC for pressure control is inherently less stable than using it for level control due to the lower pressure in the CST compared to the RPV. The greater instability is seen as an increase in oscillations.

D. The comparatively small CST volume results in the RCIC suction and discharge points in the CST being close together, and at high flow the turbulence causes oscillations.

Proposed Answer: A.

Explanation (Optional):

A. Correct – As the SRVs cycle the reactor pressure will change, this changes the steam pressure to operate the RCIC pump to maintain the constant flow the speed must change.

B. Incorrect - In auto the controller maintains flow and in manual it maintains speed. The candidate may reverse the methods of RCIC control.

C. Incorrect - The controller is equally stable in the pressure and level control modes. The candidate may believe that the operation of RCIC in other than its design function of injecting to the core is less stable

D. Incorrect - The CST has a relatively small volume compared to the SP but it does not result in oscillations. The operator may accept that the smaller flow volume results in

suction/discharge interaction

Technical Reference(s) LP NOH04RCIC00-05 RCIC (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: RCIC00E012 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Stem wording changes and explanation change for correct answer

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295031 EK3.05	
	Importance Rating	4.2	

Knowledge of the reasons for the following responses as they apply to REACTOR LOW WATER LEVEL: Emergency depressurization

Proposed Question: Common 48

Actions for Steam Cooling are being performed in accordance with HC.OP-EO.ZZ-0101, RPV Control, and RPV level has dropped to -200" on Fuel Zone indication. The procedure requires emergency depressurization.

Which of the following is the reason for emergency depressurizing?

A. Maintain peak cladding temperature below 1500 degrees F.

B. Maintain peak cladding temperature below 1800 degrees F

C. Maintain total oxidation of the cladding less than 0.17 of the total cladding thickness.

D. Maintain the maximum H2 generation less than 0.01 times the hypothetical maximum.

Proposed Answer: B

Explanation (Optional): IAW EOP-101 Bases Discussion

Steam cooling is effected by allowing RPV water level to decrease through boil-off until it drops to the Minimum Zero-Injection RPV Water Level (MZIRWL). During this period the fuel temperatures in the uncovered portion of the core increase, and heat is transferred from the fuel rods to the steam. The MZIRWL is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1800°F.

When RPV water level drops below the MZIRWL, steam cooling may no longer be sufficient to preclude the peak clad temperature from exceeding 1800°F. **Emergency RPV depressurization is then performed in accordance with EOP-202. Unless the RPV is already depressurized, it is expected that the resulting swell will be sufficient to quench the uncovered portion of the fuel and reduce PCT almost to the value that would exist if the core were submerged.** As the swell subsides and steam flow through the open SRVs decreases, however, PCT turns and again rises.

Opening the SRVs before RPV water level reaches the MZIRWL would reduce the time over which the core remains adequately cooled with no injection. Waiting much after RPV water level reaches the MZIRWL could result in significant core damage due to excessive fuel temperatures.

B. Correct - Maintain peak cladding temperature below 1800 degrees F.

A. Incorrect - Maintain peak cladding temperature below 1500 degrees F. - this is the MSCRWL the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F

C. Incorrect - Maintain total oxidation of the cladding less than 0.17 of the total cladding Thickness. - This is an ECCS criteria based on < 2200 degrees F PCT

D. Incorrect - Maintain the maximum H2 generation less than 0.01 times the hypothetical maximum. – This is ECCS criteria based on < 2200 degrees F PCT

Technical Reference(s) EOP 101 Bases (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: EO101LE008 (As available)

Question Source: Bank # 56126
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295019 AA1.03	
	Importance Rating	3.0	

Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: Instrument air compressor power supplies.

Proposed Question: Common 49

Given the following conditions:

- A loss of coolant accident has previously occurred
- The LOCA signal has cleared
- Instrument air header pressure is lowering

Which of the following describes requirements to manually start the Emergency Instrument Air Compressor (EIAC) before depressing the START pushbutton?

A. The LOCA signal must be reset then the 1E breaker closed.

B. The LOCA signal must be reset then the Non-1E breaker must be closed.

C. The LOCA signal must be reset then the 1E breaker closed AND Instrument air header pressure must then drop below 85 psig.

D. The LOCA signal must be reset then the Non-1E breaker must be closed AND Instrument air header pressure must then drop below 85 psig.

Proposed Answer: A

Explanation (Optional): A. Correct – IAW SO.KB-0001 Steps 3.3.4 & 3.3.5 - To restart the Emergency Instrument Air Compressor following a LOCA, the feeder breaker on Class 1E Unit Substation 10B450 must be reclosed. The Compressor can then be started from either the Control Room OR Local Panel 10C189. The Emergency Instrument Air Compressor will start anytime the MANUAL pushbutton is pressed.

B. Incorrect - EIAC is powered by a 1E supply.
C. Incorrect - IA header pressure is not a restraint.
D. Incorrect – EIAC is powered by a 1E supply. IA header pressure is not a restraint.

Technical Reference(s) HC.OP-SO.KB-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: INSAIRE015 (As available)

Question Source: Bank # 53430
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	WA #	295038 EA1.03	
	Importance Rating	3.7	

Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE: Process liquid radiation monitoring system.

Proposed Question: Common 50

Given the following:

- A discharge of the Equipment Drain Sample Tank is in progress to the River
- The Liquid Radwaste Discharge Isolation Valve (HV-5377A) to the Cooling Tower Blowdown automatically closes

Which one of the following condition(s) would cause this termination?
(Assume NO operator action)

(1) Liquid Radwaste Effluent High radiation setpoint is reached
(2) Cooling Tower Blowdown dilution flow low flow setpoint is reached
(3) Liquid Radwaste Effluent sample flow rate HI setpoint is reached
(4) Cooling Tower Blowdown RMS High radiation setpoint is reached
(5) Liquid Radwaste Effluent High discharge flow setpoint is reached

A. (1) and (3) ONLY

B. (2), (4) and (5) ONLY

C. (2), (3) and (4) ONLY

D. (1), (2) and (5) ONLY

Proposed Answer: D

Explanation (Optional): D. Correct IAW HC.OP-AR.SP-0001 Rev.19 Alarm Point 9RX508 (page 23)

AUTOMATIC ACTION
Isolation of HV-5377A&B due to any one of the following:
• High radiation (HIGH LED on OSP-RI-4861)
• High Disch Flow (setpoint determined by Liquid Effluent Permit)

• Low Dilution Flow (setpoint determined by Liquid Effluent Permit)
• Low Sample Flow (OHBFIS-4861)
• Monitor Failure

D. Correct.

A. Incorrect. (3) is incorrect. (5) is also correct
B. Incorrect. (4) is incorrect. (1) is also correct
C. Incorrect. (3) is incorrect. (1) is also correct.

Technical Reference(s) HC.OP-AR.SP-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RWOVERE005 (As available)

Question Source: Bank # 68906
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam 2002

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295003 AA2.04	
	Importance Rating	3.5	

Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : System Lineups

Proposed Question: Common 51

The plant was at full power with all systems operable and in their normal alignment.

- 'A' and 'C' RACS pumps were in service

Then a Loss of Offsite Power occurred.

- All four EDG's started and their loads were sequenced on as designed.

Which one of the following describes the response of RACS and Chilled Water system to this transient?

The 'A' and 'C' RACS pumps trip, then...

A. the 'A' and 'B' RACS pumps ONLY are automatically started by the LOP sequencers and Chilled Water is aligned to the Drywell coolers.

B. the 'A', 'B' and 'C' RACS pumps are automatically started by the LOP sequencers and Chilled Water is aligned to the Drywell coolers.

C. the 'A' and 'B' RACS pumps ONLY are automatically started by the LOP sequencers and RACS is aligned to the Drywell coolers.

D. the 'A', 'B' and 'C' RACS pumps are automatically started by the LOP sequencers and RACS is aligned to the Drywell coolers.

Proposed Answer: C

Explanation (Optional): C. Correct - IAW HC.OP-SO.ED-0001, Section 3.2.10 - A and B RACS Pump Motors are connected to Class 1E buses AND upon Loss of Power (LOP) without occurrence of a Loss of Coolant Accident (LOCA), A and B RACS pumps restart automatically (in 85 seconds) after the sequencer permissive is received. CHILLED WATER CONTAINMENT CLG SPLY SELECT GB-HV-9530 A1/A3 AND B1/B3 LOOP A and B SPLYIRTN CHW will close AND GB-HV-9530 A2/A4 and B2/B4 LOOP A and B SPLYIRTN RACS will open and if in AUTO,

and not in REMOTE, HV-2537 A and B HX INLET VLVS 1AE217 and 1BE217 INLET will open.
C RACS
Pump is connected to a non-1E bus (10B250) and upon loss of power, is de-energized with no restoration capabilities.

A. Incorrect. RACs is aligned to the DW Coolers
B. Incorrect. C RACs pump will have no power. RACs is aligned to the DW Coolers.
D. Incorrect. C RACs pump will have no power.

Technical Reference(s) HC.OP-SO.ED-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RACS00E009 (As available)

Question Source: Bank #
Modified Bank # 64579 (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Stem edited

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295005 AA2.03	
	Importance Rating	3.1	

Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP : Turbine valve position.

Proposed Question: Common 52

Given the following conditions:

- Reactor power is 50%
- The plant is operating normally with Main Turbine First Stage Pressure at 243 psig.

Then,

- A main generator load reject has just occurred resulting in a power/load unbalance trip.

Which one of the following is the immediate response of the Turbine Control Valves (TCVs), Intercept Valves (IVs) and the Reactor Protection System (RPS)?

A. The TCVs and IVs Fast Close.
RPS will trip.

B. The TCVs and IVs Fast Close.
RPS will NOT trip.

C. The TCVs and IVs Throttle Close.
RPS will trip.

D. The TCVs and IVs Throttle Close.
RPS will NOT trip.

Proposed Answer: A

Explanation (Optional): A. Correct

IAW EHC Lesson plan NOH01EHC LOG-04, Page 18, If a power to load unbalance occurs, the control valve and intercept valve fast acting solenoids are actuated.
IAW Turbine Lesson plan NOH01NMTURB-04, page 66, RPS is automatically bypassed at <24% power which is equal to approximately 104.2 psig first stage turbine pressure.

B. Incorrect – RPS will trip
C. Incorrect – Valves will fast close

D. Incorrect – valves will fast close. RPS will trip

Technical Reference(s) NOHO'I EHC LOG-04 (Attach if not previously provided)
NOH01NMTURB-04

Proposed references to be provided to applicants during examination: none

Learning Objective: EHCLOGE009 (As available)

Question Source: Bank #
Modified Bank # NRC 2005 (Note changes or attach parent)
New

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295037 EA2.02	
	Importance Rating	4.1	

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

Proposed Question: Common 53

While operating at 100% Reactor Power, an MSIV (NSSSS) isolation occurs and the reactor fails to scram; all rods remain at their pre-trip conditions.

The operators are in the process of deliberately lowering RPV water level.

The current plant conditions are:

- RX Power 4.5%
- RPV Pressure 900 psig
- RPV Level -120 inches
- Suppression Pool Level 79 inches and rising
- Suppression Pool Temp 175 F and rising
- Drywell Pressure 4.5 psig
- SLC Injecting with 3000 gallons remaining in SLC Tank
- Control Rods are being inserted

What action(s) are required to be performed IAW EOPs?

A. Continue to lower RPV level.

B. Open SRVs to Emergency Depressurize.

C. Restore and maintain RPV water level between +12.5 inches and +54 inches.

D. Open SRVs to depressurize.

Proposed Answer: A.

Explanation (Optional):

A. Correct - Continue to lower RPV level because power is above 4.5 %

B. Incorrect - HCTL action required and RPV water level do not meet conditions for ATWS

Emergency de-pressurization.

C. Incorrect - Can not restore RPV water level until the Reactor is shutdown under all conditions without boron, exit EOP-101A and enter EOP-101.

D. Incorrect - Suppression pool temperature can be maintained below HCTL action required area. SRVs not required

Technical Reference(s) EOP-101A (Attach if not previously provided)

Proposed references to be provided to applicants during examination: EOP-101A - no entry conditions

Learning Objective: EO101AE008 (As available)

Question Source: Bank #

Modified Bank # ID: Q56142 (Note changes or attach parent)

New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295021 G2.1.28	
	Importance Rating	4.1	

Conduct of Operations: Knowledge of the purpose and function of major system components and controls. (Loss of Shutdown Cooling)

Proposed Question: Common 54

Plant Conditions are as follows:

- Alternate Shutdown Cooling is being implemented by using the C to A RHR Loop Cross-Tie IAW HC.OP-AB.RPV-0009.

If the operator opens HV-F007C, C RHR PMP MIN FL MOV during this operation, how will the plant initially respond?

A. RHR Pump C will lose NPSH.

B. The RPV will drain to the Suppression Pool.

C. Flow through the A RHR Heat Exchanger will rise.

D. SACS outlet temperature from A RHR Heat Exchanger will rise.

Proposed Answer: B.

Explanation (Optional):

B. Correct - Opening HV-F007 C will establish a drain path from the B Recirculation Pump Loop to the Torus via C RHR Pump Suction and HV-F007

A. Incorrect - C RHR Pump would eventually lose NPSH. The stem stipulates the selection of the first consequence

C. Incorrect - The flow which existed initially in the A RHR Heat Exchanger will lower due to a drain path being opened to the Torus.

D. Incorrect - The loss of RHR flow to the A RHR Heat Exchanger will lower the heat burden on SACS and hence the SACS outlet temperature will not rise.

Technical Reference(s) HC.OP-AB.RPV-0009, Rev.5 Caution 1.6 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ABRPV9E004 (As available)

Question Source: Bank # ID: Q61858
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X
_____

Comments:
Is the second bullet required in the stem? No, removed bullet

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	WA #	295024 G2.4.1	
	Importance Rating	4.6	

Emergency Procedures / Plan: Knowledge of EOP entry conditions and immediate action steps. (High DW pressure)

Proposed Question: Common 55

A small break LOCA occurs and the following conditions exist:

- Drywell pressure is 2.5 psig
- Drywell temperature is 150°F
- Reactor Water Level is +15 inches
- Suppression pool temperature is 93 degrees F
- Suppression Pool pressure is 1.6 psig
- Suppression Pool level is 77 inches

Which of the following correctly describes the sections of Emergency Operating Procedures which have been entered and the initial step(s) required?

A. ALL sections of OP-EO.ZZ-101, ReactorIPressure Vessel (RPV) Control, and ALL sections of OP-EO.ZZ-102, Primary Containment Control.
Lock the Mode Switch in Shutdown.

B. ALL sections of OP-EO.ZZ-101, ReactorIPressure Vessel (RPV) Control, and ALL sections of OP-EO.ZZ-102, Primary Containment Control.
Lock the Mode Switch in Shutdown and place Drywell Spray in service.

C. Drywell Pressure (DW/P) and Drywell Temperature (DW/T) sections of OP-EO.ZZ-102, Primary Containment Control only, and ALL sections of OP-EO.ZZ-101, ReactorIPressure Vessel (RPV) Control.
Lock the Mode Switch in Shutdown.

D. Drywell Pressure (DW/P) and Drywell Temperature (DW/T) sections of OP-EO.ZZ-102, Primary Containment Control only, and ALL sections of OP-EO.ZZ-101, ReactorIPressure Vessel (RPV) Control.
Lock the Mode Switch in Shutdown and place Drywell Spray in service.

Proposed Answer: A

Explanation (Optional): A. Correct – IAW EOP entry conditions and initial steps. Per EOP usage guidance all legs of each EOP are performed concurrently. Conditions are not met for Drywell spray (see attached EOPs)

A. Correct.

B. Incorrect. Drywell spray conditions not met
C. Incorrect. All legs of both EOPs 101 and 102 must be entered
D. Incorrect. All legs of both EOPs 101 and 102 must be entered. Drywell spray conditions not met

Technical Reference(s) EOP 101 & 102 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: DSIL curve

Learning Objective: EO101LE003 (As available)

Question Source: Bank # 56092
Modified Bank # ____ (Note changes or attach parent)
New ____

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis ____

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295016 G2.4.46	
	Importance Rating	4.2	

Emergency Procedures / Plan: Ability to verify that the alarms are consistent with the plant conditions

Proposed Question: Common 56

Plant conditions are as follows:

- A fire causes an MSIV closure resulting in a scram
- HC.OP-AB.HVAC-0002, Control Room Environment is complete
- Control is being established at the Remote Shutdown Panel (RSP) IAW HC.OP-IO.ZZ-0008, Shutdown from Outside the Control Room
- All Transfer Switches are in the Emergency position
- While placing RCIC in service at the RSP the following indication is received:
  - "TURBINE TRIPPED" and "BRG OIL LOW PRESS" alarm indicating lights illuminated

Which one of the following would cause this response?

A. RCIC System trip on high RPV water level.

B. Trip of the RCIC Turbine Mechanical Overspeed device.

C. RCIC System Steam Line break causing an automatic system Isolation.

D. Consequences of the fire because there are NO automatic actions associated with the RCIC system with control from the RSP.

Proposed Answer: B

Explanation (Optional):

IAW HC.OP-IO.ZZ-0008, Note 3.1.8.D

B. CORRECT - Trip of the RCIC Turbine Mechanical Overspeed device. With control at the RSP, all automatic trips and interlocks are disabled. One exception is the RCIC Overspeed Trip. Since it is a mechanical device, it will perform its function even with control at the RSP.

A. INCORRECT - RCIC System trip on high RPV water level. With control at the RSP, all automatic trips and interlocks are disabled.

C. INCORRECT - RCIC System Steam Line break causing an automatic system Isolation. With control at the RSP, all automatic trips and interlocks are disabled.

D. INCORRECT - Consequences of the fire, there are NO automatic actions associated with the RCIC system with control from the RSP. One exception is the RCIC Overspeed Trip. Since it is a mechanical device, it will perform its function even with control at the RSP.

Technical Reference(s) HC.OP-IO.ZZ-0008 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: IOP008E004 (As available)

Question Source: Bank # 62224
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
In Stem, Enhance nomenclature for alarms on RSP

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295028 EK2.01	
	Importance Rating	3.7	

Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Drywell spray: Mark-I&II.

Proposed Question: Common 57

Which one of the following describes the consequences of spraying the drywell when drywell temperature is ABOVE the drywell temperature limit of the Drywell Spray Initiation Limit Curve?

A. External pressure limits on the Secondary Containment would be exceeded.

B. Automatic Depressurization System instruments would NO longer be qualified for these conditions.

C. The relief capacity of the Suppression Chamber to Drywell vacuum breakers would be exceeded.

D. RPV water level instrumentation would become inaccurate due to rapidly lowering drywell temperatures.

Proposed Answer: C.

Explanation (Optional):

C. Correct - If unrestricted, the evaporative cooling affect of Drywell spray could result in an immediate, rapid and large reduction in Drywell pressure at a rate much faster than can be compensated for by the Primary Containment Vacuum Relief System and thus result in a negative Drywell-to-Suppression Chamber differential pressure large enough to cause a loss of Primary Containment integrity.

A. Incorrect – The limit of concern is on the Primary Containment.

B. Incorrect - There is no relationship between the DSIL Curve and ADS. The DSIL Curve permits Spray for a wide range of pressures with Drywell temperature above 340°F.

D. Incorrect - Inaccurate level indication may occur when drywell temperature exceeds the saturation temperature for the existing RPV pressure, since drywell sprays lower drywell temperature they will have the opposite affect.

Technical Reference(s) Bases for DW Spray Curve-EOP-102 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: EO102PE006 (As available)

Question Source: Bank # _____
Modified Bank # ID: Q53337 (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	600000 AA1.06	
	Importance Rating	3.0	

Ability to operate and / or monitor the following as they apply to PLANT FIRE ON SITE: Fire Alarm

Proposed Question: Common 58

The plant is operating at rated power. A fire alarm is received in the following area:

- Control Equipment Mezzanine E1.117 (below the Control Room)

Which one of the following describes the permanently installed fire protection system(s) available to suppress a fire in this area?

A. Halon ONLY

B. Halon and C02

C. Water Sprinkler System ONLY

D. Water Sprinkler System and C02

Proposed Answer: D

Explanation (Optional): IAW Prints M-22 sheets 3 and 5

D. CORRECT:

A. INCORRECT: Halon is installed under the control room console and is not permanently installed

B. INCORRECT: Halon is installed under the control room console and is not permanently installed

C. INCORRECT: C02 is also installed in thls area

Technical Reference(s) Prints M-22 sheets 3 and 5 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: FIRPROE013 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
Change to what systems are available in various areas: I.E. Relay Room, EDG room
Revised

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295010 AK1.01	
	Importance Rating	3.0	

Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: Downcorner submergence: Mark-I&II.

Proposed Question: Common 59

Which of the following events would result in compromising the pressure suppression function of primary containment?

(1) Uncovering the SRV T-Quenchers
(2) Downcomer openings becoming uncovered
(3) Torus to Drywell Vacuum Breakers failing closed
(4) Reactor Building to Torus Vacuum Breakers failing open

A. (1) and (2) ONLY

B. (2) and (3) ONLY

C. (1) and (4) ONLY

D. (3) and (4) ONLY

Proposed Answer: A.

Explanation (Optional): IAW EOP102 bases SP/L-7

A. Correct – (1) and (2) would result in pressurizng directly the containment atmosphere therby potentially compromising high pressure limit in the containment

B. Incorrect – SRV t-quenchers correct
C. Incorrect – downcomer openings correct, Rx bldg to torus vac bkrs failing open would relieve torus pressure.
D. Incorrect – would not compromise Pressure Supression function, suppression pool would still be available.

Technical Reference(s) EOP 102 bases (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: EOP102E009 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	WA #	295022 AK2.03	
	Importance Rating	3.4	

Knowledge of the interrelations between LOSS OF CRD PUMPS the following: Accumulator pressure

Proposed Question: Common 60

Given the following:

- The plant is at 37% power
- Both CRD pumps are tripped on low suction pressure
- The Reactor Building Operator is swapping CRD suction filters
- CRD ACCUM TROUBLE Overhead Annunciator C6-D4 is clear

For the two minutes following the CRD pump trip, what will be the response of HCU Accumulator Gas pressure?
(Assume NO other operator actions)

HCU Accumulator Gas pressure …

A. stays the same because reactor pressure holds the charging water check valve closed.

B. stays the same because cooling water pressure holds the charging water check valve closed.

C. lowers because the accumulator piston moves when charging water header pressure is lost.

D. lowers because the cooling water pressure lowers when charging water header pressure is lost.

Proposed Answer: C

Explanation (Optional): HC.OP-IS.BF-0103

Charging water check valve 115 maintains water volume on a loss of charging pressure from the CRD pumps initially. However, Accumulator gas pressures will begin to lower immediately after pump trip depending on the leak rate of the check valves. Actual plant experience demonstrated that the first alarm comes in at 2.1 minutes. N2 gas pressure will remain the same as long as the check valve holds. When the check valve begins to leak, the piston will stroke and N2 pressure will drop causing low accumulator pressure alarm.

C. Correct.

A. Incorrect. Lowers due to check valve leak by. Also reactor pressure does not hold the check valve closed
B. Incorrect. Lowers due to check valve leak by. Also water pressure does not hold the check valve closed.
D. Incorrect. The pressure lowers due to check valve leak by.

Technical Reference(s) HC.OP-IS.BF-0103 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: CRDHYDE017 (As available)

Question Source: Bank # 68914
NRC2002
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Stem edited, look at distractor "D"
Left distractor D as is per NRC comment

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295032 EK3.02	
	Importance Rating	3.6	

Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Reactor SCRAM.

Proposed Question: Common 61

Given the following conditions:

- An unisolable steam line leak has occurred in the RCIC room
- RCIC Equipment Room Area Temperature is 207°F and rising

Which of the following is the reason for initiating a Reactor Scram with the above conditions?

A. Emergency Depressurization is anticipated.

B. The scram will begin to reduce the energy that the RPV will discharge to the RCIC room.

C. A scram will reduce the driving head and flow through the break in the RCIC room to prevent the blowout panel from opening.

D. Failure of Secondary Containment due to high temperatures must be assumed and the scram will stop the radioactive release.

Proposed Answer: B.

Explanation (Optional):

From EOP-103 bases:
If temperatures or floor levels in any one of the ROOMS listed in Table 1 or 2 of Reactor Building Control approach their maximum safe operating value, adequate core cooling, containment integrity, safety of personnel, or continued operability of equipment required to perform EOP actions can no longer be assured. EOP-101 must be entered to make certain the reactor is scrammed. Scramming the reactor reduces to decay heat levels the energy that the RPV may be discharging to the reactor building.

A. Incorrect – the scram is not performed for anticipating an ED. Levels may not reach the ED requirement
B. Correct
C. Incorrect. – The blowout panel is not a concern per the bases.
D. Incorrect – The failure of Secondary Containment is not a concern at this point in the event with the conditions stated.

Technical Reference(s) EOP-103 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: EOP103E006 (As available)

Question Source: Bank #
Modified Bank # (Note changes or attach parent)
New X

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	WA #	295029 EA1.O1	
	Importance Rating	3.4	

Ability to operate and/or monitor the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL HPCI: Plant-Specific.

Proposed Question: Common 62

HPCl and RClC both started and are injecting in response to a valid low reactor water level. Current plant conditions are as follows:

- Reactor water level is +25 inches, steady
- Reactor pressure is 845 psig, rising slowly
- Drywell pressure is 1.1 psig, steady
- RClC has been aligned to Full Flow Recirc operation (CST to CST) for pressure control
- HPCl is injecting to the reactor for level control

After 10 minutes of operation, suppression pool level reaches 78.5 inches.

Which of the following would be the response of HPCl & RCIC for the given conditions?

A. HPCl will continue to inject and RClC will operate on minimum flow.

B. HPCl will continue to inject and RClC will trip on low suction pressure.

C. HPCl will trip on low suction pressure and RClC will operate on minimum flow.

D. HPCl will trip on low suction pressure and RClC will trip on low suction pressure.

Proposed Answer: A.

A. Correct - The F011 closes on the HPCl Suppression Pool Suction Valve (F042) opening. HPCl will continue to inject, RClC has no discharge path, Min. flow opens.

B. lncorrect - RClC Suction flow path will remain on the CST.
C. lncorrect - HPCl will continue to inject, AP-HV-FO11 closes in the return line to the CST.
D. lncorrect - HPCl will continue to inject, RClC has no discharge path, Min. flow opens.

Technical Reference(s) HC.OP-SO.BJ-0001(Q), Sect 3.3 Interlocks (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: HPCI00E012 (As available)

Question Source: Bank # X
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Stem edit, need to check validation (are C & D credible in regard to low suction pressure trip)
Checked validation , per NRC leave as is

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295012 AA2.02	
	Importance Rating	3.9	

Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell pressure.

Proposed Question: Common 63

Given the following conditions:

- The plant is operating at 100% power.
- The COMPUTER PT IN ALARM A4-F5 alarm is received.
- Drywell pressure is 1.1 psig.
- HC.OP-AB.CONT-0001, Drywell Pressure abnormal is entered.

Which of the following events, BY ITSELF, could be the cause of the pressure rise?

A. Failure of the " A Reactor Recirculation Pump #2 Seal

B. FV-4971 Nitrogen Flow Control Valve fails open

C. Torus Vent Valve Isolation Valve HV-11541 fails open

D. Loss of power to multiple Drywell Fans

Proposed Answer: D.

Explanation (Optional):

D. Correct: A reduction in cooling will raise temperature and therefore pressure in the Drywell.

A. Incorrect: Assuming the #1 seal is intact, no change in DW conditions will occur.
B. Incorrect: During normal operation, the nitrogen FCV is isolated from the DW.
C. Incorrect: A vent valve opening would result in a reduction in pressure. However the rupture disk downstream of HV-11541 should be intact resulting in no effect on DW pressure.

Technical Reference(s) HC.OP-AB.CONT-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ABCNT1E004 (As available)

Question Source: Bank # 61761
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam 2007

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X
_____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295009 G2.1.20	
	Importance Rating	4.6	

Conduct of Operations: Ability to interpret and execute procedure steps.(Low reactor water level)

Proposed Question: Common 64

Given the following conditions:

- A startup following a refueling outage was in progress when a loss of offsite AC Power occurred.
- Only A, C, and D Emergency Diesel Generators are running.
- HPCI and RCIC are NOT available.
- All control rods are at 00.
- RPV water level is stable at (-35) inches.
- RPV pressure is stable at 910 psig.
- NO operator actions have been taken.

Which of the following statements describes the actions required for the conditions above?

A. Restore and maintain level to +12.5 to +54 inches by maximizing CRD flow.

B. Lower reactor pressure to 600 psig and restore level using the Secondary Condensate Pumps.

C. Emergency Depressurize the reactor and restore level using the low pressure ECCS systems.

D. Override 1E Breakers and restore RFPTs to raise RPV level to between +12.5 and +54 inches.

Proposed Answer: A

Explanation (Optional):

A. Correct - No ATWS exists and Level is not lowering. A, C and D diesels allows use of RACS and 2 CRD pumps. CRD is a Preferred Table 1 system 0-1500 psig.

B. Incorrect – This would be the normal method, but condensate has lost power

C. Incorrect - ED not required. RPV level still too high.

D. Incorrect – No power for secondary and primary condensate pumps

Technical Reference(s) HC.OP-EO.ZZ-0101, Steps (Attach if not previously provided)

RC/L-2 thru RC/L-5

Proposed references to be provided to applicants during examination: None

Learning Objective: EO101LE006 (As available)

Question Source: Bank # ID: Q76668
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Edit distractor "D"

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295013 AK3.02	
	Importance Rating	3.6	

Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL TEMPERATURE: Limiting heat additions.

Proposed Question: Common 65

The plant is operating at 80% power with RCIC quarterly testing in progress.

Which one of the following is the reason for the Technical Specification temperature limitation for the suppression pool during the test?

A. To assure primary containment integrity following a stuck open Safety Relief Valve.

B. To assure that excessive steam condensing loading does NOT occur during the test.

C. To assure that Suppression Pool Temperature Design Limit is not reached following an Emergency Depressurization.

D. To assure sufficient RHR and Core Spray NPSH exists during LOCA conditions without overpressure.

Proposed Answer: D.

Explanation (Optional):

D. Correct - TS requires any testing that adds heat to the SP be terminated at 105°F the TS bases is PC integrity during a LOCA and NPSH without overpressure for RHR and Core Spray.

A. Incorrect - the bases is for a LOCA.
B. Incorrect - not a concern during the test
C. Incorrect - NPSH without overpressure for RHR and Core Spray.

Technical Reference(s) T.S. 3.6.2 Bases (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
Look at distractor "C" – Revised "C"

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	1	
	K/A #	G2.1.30	
	Importance Rating	4.4	

Ability to locate and operate components, including local controls.

Proposed Question: Common 66

Given the following conditions:

- Control Room has been abandoned
- Control has been transferred to the Remote Shutdown Panel (RSP)
- RPV level is +10 inches
- RPV pressure is 80 psig

Which one of the following describes the ability to operate the BC-HV-FOO9 SDC Suction Isolation valve and whether the valve would close automatically if reactor pressure exceeded 82 psig?

A. The valve CAN be opened at the RSP.
If already open, the valve would automatically close.

B. The valve CAN be opened at the RSP.
If already open, the valve would NOT automatically close.

C. The valve CANNOT be opened at the RSP.
If already open, the valve would NOT automatically close.

D. The valve CANNOT be opened at the RSP.
If already open, the valve would automatically close.

Proposed Answer: B

Explanation (Optional): Note and a Caution in HC.OP-IO.ZZ-0008 (5.9.6 of Rev 28) - CAUTION WHEN the RSP Transfer Switch is placed in EMER, RHR S/D Cooling interlocks for overpressure AND low Reactor level are inoperable. RX pressure of 80 psig should NOT be exceeded WITH Suction Valves F008 & F009 open.

B. Correct. When control is transferred to the RSP, both the Low RPV Water Level AND high RPV Pressure isolations for the BC-HV-FOO9 are defeated. There remains a pressure switch permissive in series with the opening contactor that requires reactor pressure to be below 82 psig to open the valve (this is NOT a function of NSSSS). This is identified in a

Note and a Caution in HC.OP-IO.ZZ-0008 (5.9.6 of Rev 23).

A. Incorrect - The valve will NOT isolate if reactor pressure exceeds 82 psig.
C. Incorrect. The valve CAN be opened, since the RPV Low Water Level isolation is defeated and there is NO Low Water Level opening permissive.
D. Incorrect. The valve can be opened. The valve will NOT isolate if reactor pressure exceeds 82 psig.

Technical Reference(s) HC.OP-IO.ZZ-0008 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: IOP008E006 (As available)

Question Source: Bank # 53914
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

Comments:
Edited stem

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	1	
	K/A #	G2.1.4	
	Importance Rating	3.3	

Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.

Proposed Question: Common 67

You are a licensed Reactor Operator. Due to illness, you have worked the following schedule over the past quarter (July thru September).

July 1 - Off
July 2 - Off
July 3 - 12 hour day shift as RO
July 4 - 12 hour day shift as RO
July 8 - 12 hour night shift as RO
July 9 - 12 hour night shift as RO
July 10 Through September 30 – Off Shift due to illness.

All licensed operator training is up to date.
You have received medical clearance to stand watch.

Which one of the following describes the status of your license and additional requirements, if any, to stand watch on October 1st IAW OP-AA-105-102 "NRC ACTIVE LICENSE MAINTENANCE"?

A. Your license is Active because you stood watch for at least 40 hours the previous quarter, no additional requirements are needed to stand watch on 1011.

B. Your license is Inactive. You must reactivate your license by performing shift functions under the sole direct supervision of an active licensed RO for at least 40 hours.

C. Your license is Inactive. You must reactivate your license by performing shift functions under supervision for at least 40 hours. ONLY an active licensed SRO may provide this supervision.

D. Your license is Inactive. You must reactivate your license by performing shift functions under the sole direct supervision of ONLY an active licensed RO for one additional 12 hour shift.

Proposed Answer: B

Explanation (Optional): IAW OP-AA-105-102 "NRC ACTIVE LICENSE MAINTENANCE, Steps 4.1.1. & 4.2.1

MAINTAIN an active license by actively performing the functions of RO, SRO, or LSRO.
1. RO licenses by performing the duties of the Unit RO and/or Unit Assist RO for a minimum of seven 8-hour or five 12-hour shifts per calendar quarter, including turnover to the next shift.

REACTIVATE an RO or SRO license to an "active status" by performing 40 hours of shift functions in the presence and under the sole direct supervision of an active RO or SRO, as appropriate and in the position to which the individual will be assigned.

A. Incorrect. License is inactive. Previous quarter requirements not met
B. Correct.
C. Incorrect. An RO is required
D. Incorrect. Previous quarter requirements not met with one additional shift on 1011. One day too late.

Technical Reference(s) OP-AA-105-102 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: NOH04ADM062C-01 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments: edited spacing in stem and edited distractors

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	2	
	K/A #	G2.2.6	
	Importance Rating	3.0	

Knowledge of the process for making changes to procedures

Proposed Question: Common 68

Given the following conditions:

- The plant is operating at rated power.
- The Common Offgas train is experiencing problems and must be swapped before vacuum starts degrading.

While performing the evolution brief, a critical procedure step was found to be missing.

Which of the following describes the requirement, if any, to continue the evolution?

A. Complete the evolution as written then perform a permanent revision change after the evolution is complete.

B. A procedure change request is required and an on-the-spot-change can be made.

C. Obtain verbal concurrence from the CRS to change the sequence of steps and continue.

D. A full procedure revision to the Offgas system operating procedure is required. An on-the-spot change CANNOT be performed.

Proposed Answer: B

Explanation (Optional): IAW AD-AA-101-101

B. Correct. An on-the-spot-change (OTSC) may used.

A. Incorrect. If an error is found in the procedure actions must be taken to correct the issue before proceeding.
C. Incorrect. Written documentation is required (On-the-spot change)
D. Incorrect. An on-the-spot change may be used

Technical Reference(s) AD-AA-101-101 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ADMPROE002 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	2	
	K/A #	G2.2.12	
	Importance Rating	3.7	

Knowledge of surveillance procedures

Proposed Question: Common 69

The CRS has directed you to perform a RCIC inservice test following maintenance using HC.OP-IS.BD-0001, Reactor Core Isolation Cooling (RCIC) Pump - OP203 - Inservice Test.

Which one of the following describes a surveillance procedure requirement due to the performance of the test?

A. Suppression Pool Temperature Monitoring prior to starting the RCIC pump.

B. Place both loops of Suppression Pool Cooling in service when Suppression Pool temperature exceeds 95 degrees F.

C. RCIC must be secured when Suppression Pool temperature reaches 110 degrees F.

D. Remote Shutdown System Suppression Pool Temperature Instrumentation Channel Check.

Proposed Answer: A

Explanation (Optional):

A. Correct

B. Incorrect – Both loops are not required . Also, SPC is required prior to placing the pump in service

C. Incorrect – RCIC must be secured when temperature reaches 105 dgrees F.

D. Incorrect – not required by the procedure.

Technical Reference(s) HC.OP-IS.BD-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ _____ (As available)

Question Source: Bank # INPO 19132
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
Edited "B" distractor

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	3	
	K/A #	G2.3.4	
	Importance Rating	3.2	

Knowledge of radiation exposure limits under normal or emergency conditions.

Proposed Question: Common 70

A Hope Creek operator has received the following dose:

- November 1, 2008 thru November 21, 2008 - 350 mrem - while visiting a foreign nuclear plant as part of a Technical Exchange Program.
- July 1, 2008 thru December 31, 2008 - 175 mrem - while working at Hope Creek.
- January 1, 2009 thru January 31,2009 - 125 mrem - while working at Hope Creek.

Which of the following describes the MAXIMUM additional non-emergency Total Effective Dose Equivalent (TEDE) that this individual could receive at Hope Creek through October 31, 2009?

A. 1350 mrem

B. 1700 mrem

C. 1875 mrem

D. 2375 mrem

Proposed Answer: C

Explanation (Optional): IAW

C. Correct – 2000 – 125 = 1875

A. Incorrect. – prior year is not included
B. Incorrect. – prior year is not included
D. Incorrect. – limit is 2000 not 2500 per year

Technical Reference(s) RP-AA-203 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: NOH04ADM024C-01 (As available)

Question Source: Bank # _____
Modified Bank # 77351 (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X
_____

Comments:
Edited stem

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	3	
	K/A #	G2.1.3	
	Importance Rating	3.7	

Knowledge of shift or short-term relief turnover practices

Proposed Question: Common 71

Which one of the following describes Reactor Operator pre-and post-shift relief actions that should be implemented by the oncoming operator IAW OP-AA-112-101 "Shift Relief and Turnover"?

A. PRIOR to relief, read the Control Room logs through the last previous date on shift, or the preceding four (4) days logs, whichever is less.
PRIOR to relief, review the Daily Orders.
POST relief, tour the main control room back panels.

B. PRIOR to relief, read the Control Room logs through the last previous date on shift, or the preceding seven (7) days logs, whichever is less.
PRIOR to relief, tour the main control room back panels.
POST relief, review the Daily Orders.

C. PRIOR to relief, read the Control Room logs through the last previous date on shift, or the preceding four **(4)** days logs, whichever is less.
PRIOR to relief, tour the main control room back panels.
POST relief, review the Daily Orders.

D. PRIOR to relief, read the Control Room logs through the last previous date on shift, or the preceding seven (7) days logs, whichever is less.
PRIOR to relief, review the Daily Orders.
POST relief, tour the main control room back panels.

Proposed Answer: C

Explanation (Optional): C. Correct

IAW OP-AA-112-101 "Shift Relief and Turnover" – Section 4.8.3. - Prior to relief, the on-coming Reactor Operators should PERFORM the following:

– READ the Control Room logs through the last previous date on shift, or the preceding four days logs, whichever is less.

– DISCUSS with the off-going Reactor Operator all items listed on the turnover sheet, Shiftly and Daily Surveillance, and any other information pertinent to

proper continuity of operations.
– TOUR Main Control Room back panel areas
After relief, the on-coming RO's should PERFORM the following:
– ANNOUNCE shift turnover and relief to the Unit Supervisor.
– CONFER with the Unit Supervisor to determine the scope of planned shift activities and their responsibilities for that shift.
– REVIEW Daily Orders.
– REVIEW Standing Orders for new entries.

A. Incorrect – the back panels are toured prior to relief, the daily orders are reviewed post relief.
B. Incorrect – only the preceeding 4 days logs should be reviewed
D. Incorrect - the back panels are toured prior to relief, the daily orders are reviewed post relief. Only the preceeding 4 days logs should be reviewed.

Technical Reference(s) IAW OP-AA-112-101 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ADMPRO102E004 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	4	
	WA #	G2.4.43	
	Importance Rating	3.2	

Knowledge of emergency communications systems and techniques.

Proposed Question: Common 72

An Alert has been declared at Hope Creek. You have been designated as the Secondary Communicator (CM2).

IAW the ECG Secondary Communicator Log, you are required to_____

A. activate ERDS within 30 minutes from the Shift Manager OR Control Room SPDS terminal.

B. activate ERDS within 60 minutes from the Shift Manager OR Control Room SPDS terminal.

C. establish communications with state and local organizations using ERDS within 30 minutes.

D. establish communications with state and local organizations using ERDS within 60 minutes.

Proposed Answer: B

Explanation (Optional):

B. Correct – IAW ECG Att.8 section A.4.b.

A. Incorrect - required within 60 minutes

C. Incorrect – ERDS is not used for this purpose

D. Incorrect - ERDS is not used for this purpose

Technical Reference(s) ECG, ATT 8. Section A.4.b. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: _____ (As available)

Question Source: Bank # _____

	Modified Bank #		(Note changes or attach parent)
	New	X	
Question History:	Last NRC Exam		
Question Cognitive Level:	Memory or Fundamental Knowledge	X	
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	X	

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	4	
	K/A #	G2.4.18	
	Importance Rating	3.3	

Knowledge of the specific bases for EOPs.

Proposed Question: Common 73

EOP 102 PRIMARY CONTAINMENT COIVTROL, contains the following retainment override.

IF while executing the following steps	THEN
All entry conditions have cleared	**EXIT** this procedure
Drwl sprays have been initiated	BEFORE Drwl press reaches **0 psig**, **TERMINATE** drwl sprays
Supp chamber sprays have **been** initiated	BEFORE suppression chamber press reaches **0 psig**, TERMINATE supp chamber sprays
SAG **entry** is required.	**EXIT** this procedure and ENTER SAG

Which one of the following statements describes the bases for terminating drywell spray before drywell pressure reaches 0 psig?

A. It makes one more RHR loop available as soon as possible for injection into the reactor pressure vessel.

B. This action ensures that the drywell structure will NOT endure excessive thermal stresses due to rapid cooldown.

C. It ensures a drywell temperature below 212 degrees F, therefore there is NO need to continue drywell sprays.

D. It prevents drawing a negative pressure in the containment, which would open the vacuum breakers and draw air into the containment.

Proposed Answer: D

Explanation (Optional):

IAW EOP 102 Bases for step PCC-1 - It prevents drawing a negative pressure in the

containment, which would open the vacuum breakers and draw air into the containment.

D. Correct.

A. Incorrect - Concern is de-inerting containment.
B. Incorrect - a negative pressure will open the SC to RB vacuum breakers and de-inert containment. Thermal stress is not a concern.
C. Incorrect – Concern is de-inerting containment.

Technical Reference(s) EOP 102 Bases for step PCC-1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: EO101PE008 (As available)

Question Source: Bank # 80632
Modified Bank # ____ (Note changes or attach parent)
New ____

Question History: Last NRC Exam 2003

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis ____

10 CFR Part 55 Content: 55.41 X
____

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	2	
	K/A #	G2.2.13	
	Importance Rating	4.1	

Knowledge of tagging and clearance procedures

Proposed Question: Common 74

IAW the Safety Tagging Program procedures, which of the following statements is correct regarding Worker's Blocking Tags (WBTs)?

A. The Clearing Agent will place a label designating the Worker and Job Technician on the WBT.

B. A WBT may be used to isolate a high voltage energy source (>600 volts).

C. A Work Clearance Document (WCD) containing WBTs may also contain Yellow Permissive Tags (YPTs).

D. Two WBTs may be simultaneously installed on the same blocking point.

Proposed Answer: C

Explanation (Optional): SH.OP-AP.ZZ-0015, rev 20 Att. 3

C. CORRECT- A Work Control Document (WCD) containing WBTs may also contain Yellow Permissive Tags (YPTs). WCDs containing WBTs may contain other tag types such as RBTs and YPTs.

A. INCORRECT - A label designating the Worker and the Clearing Agent shall be placed on the WBT by the Worker.

B. INCORRECT - A WBT may not be used to isolate a high voltage energy source.

D. INCORRECT - The WBT shall not be installed on any blocking point that is already tagged with any safety tag except for a WCT.

Technical Reference(s) SH.OP-AP.ZZ-0015, rev 20 Att. 3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: NA0015E004 (As available)

Question Source: Bank # 62253
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
_____

Comments:
Edited KA statement

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	3	
	K/A #	G2.3.13	
	Importance Rating	3.4	

Knowledge of Radiological Safety procedures pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Proposed Question: Common 75

The following conditions exist for a job to be performed on a system.

- The general area radiation levels are 10 mremlhr in the room.
- The hot spot in the room is a pipe elbow that has a radiation level of 100 mremlhr. The job will be performed near the hot spot area.

(Assumptions: ALL 4 cases below have the same transition time to and from destinations. All shielding placement and removal is at 100 rnremlhr. The hot spot with shielding in place is 10 rnremlhr)

Which one of the following methods would comply with ALARA procedural requirements for performance of the task?

A. The job is performed by using 2 operators for 3 hrs each on the job at the hot spot.

B The job is performed by 3 operators for 1 hr each on the job at the hot spot and a fourth operator reading instructions in the general room area for 1 hr.

C. The job is performed by 2 operators for 2 hrs each on the job at the hot spot and a third operator reading instructions in the general room area for 2 hrs.

D. Two Radiation Protection personnel hang and remove 1 tenth thickness of lead shielding on the hot spot in 1.5 hours for the job. The job is performed after the lead shielding is in place by using 2 operators for 3 hrs each on the job.

Proposed Answer: B

Explanation (Optional):

B. Correct: The job is performed by 3 operators for 1 hr each on the job at the hot spot and a fourth operator reading instructions in the general room area for 1 hr.(3 operators X 100 mremlhr x 1hr) + (1 operators X 10 mremlhr x 1hr) = 310 mremlhr.

A. Incorrect: The job is performed by using 2 operators for 3 hrs each on the job at the hot spot. (2

operators X 100 mremlhr x 3hrs) = 600 mremlhr.

C. Incorrect: The job is performed by 2 operators for 2 hrs each on the job at the hot spot and a third Operator reading instructions in the general room area for 2 hrs. (2 operators X 100 mremlhr x 2hr) + (1 operators X 10 mremlhr x 2hrs) = 420 rnremlhr.

D. Incorrect: Two Radiation Protection personnel hang and remove 1 tenth thickness of lead shielding on the hot spot in 1.5 hours for the job. The job is performed after the lead shielding is in place by using 2 operators for 3 hrs each on the job. (2 rad techs X 100 mremlhr x 1.5hrs) + (2 operators X 10 mremlhr x 3hr) = 360 rnremlhr.

Technical Reference(s) RP-AA-400 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

Question Source: Bank # WTS Bank
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	295021 AA2.01	
	Importance Rating		3.6

Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING: Reactor water heatup/cooldown rate.

Proposed Question: SRO 76

The plant is shutting down for a refuel outage. Shutdown Cooling has been in service for 1 hour.

T= 12:00 - RPV temperature is 149 degrees F.

Then, a complete loss of Shutdown Cooling occurs.

After 20 minutes, the operators determine that RPV temperature is rising at 16 degrees every 10 minutes.

T= 12:20 - RPV temperature is 186 degrees F.

Which one of the following describes how the heatup, if it continues at the rate stated above, will affect the plant Operational Condition and Technical Specification (TS) heatup limits?

A. After T=12:30, a mode change will occur. At T=13:00, the TS heatup rate limit will be exceeded.

B. Before T=12:30, a mode change would occur. At T=13:00, the TS heatup rate limit will be exceeded.

C. After T=12:30, a mode change will occur. At T=13:00, the TS heatup rate limit will NOT be exceeded.

D. Before T=12:30, a mode change would occur. At T=13:00, the TS heatup rate limit will NOT be exceeded.

Proposed Answer: B

Explanation (Optional): Mode change occurs at >200 dgrees F. per TS definitions. The TS heatup limit is 100 degrees in a one hour period. Although the rate is >100 degrees per hour the limit is not exceeded until the one hour time period has been met (1200 – 1300)

TS 3.4.6.1.a. & TS definitions of operational conditions

B. Correct. Mode change has already occurred. (202 F @12:30) Limit has been exceeded.

101 degrees F at 1300. (149 @ 12:00 to 250 @ 13:00)

A. Incorrect. Mode change has already occurred. (202 F @12:30)
C. Incorrect. The TS limit has been exceeded. 101 degrees @13:00
D. Incorrect. A mode change would occur prior to 1230 (202 F @12:30) The TS limit has been exceeded. 101degrees @13:00

Technical Reference(s) TS 3.4.6.1.a. & TS definitions (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: RXVESSEE007 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 2

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	295023 AA2.05	
	Importance Rating		4.6

Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS: Entry conditions of Emergency plan

Proposed Question: SRO 77

Given the following:

- The plant is in OPCON 5.
- Core offload is in progress.
- A spent fuel bundle is full up on the main hoist over the core.
- The refuel bridge spotter notices the fuel bundle has become unlatched and has fallen into the vessel.

A short time later, the following Refuel Floor Rad Monitors are in HIGH alarm:

- Spent Fuel Pool ARM
- Refuel Floor Exhaust Channels A, B, C
- General Area radiation surveys have NOT been performed
- All other plant systems are operating as designed

Which one of the following describes actions required IAW AB-CONT-0005 "Irradiated Fuel Damage" and the Emergency Plan?

Suspend the handling of Irradiated Fuel/Components…

A. re-establish Secondary Containment and declare an Alert.

B. re-establish Secondary Containment and perform a 4 hour report to the NRC.

C. evacuate all unnecessary personnel from the refuel floor and declare an Alert.

D. evacuate all unnecessary personnel from the refuel floor and perform a 4 hour report to the NRC.

Proposed Answer: C

Explanation (Optional): ECG Section 6.4.2.b. – with the alarms noted in stem an Alert declaration is warranted.

C. Correct.

A. Incorrect. Secondary Containment was not lost based on stem conditions

B. Incorrect. Secondary Containment was not lost based on stem conditions
D. Incorrect. May be correct if Alert is believed to be incorrect. Based on voluntary/courtesy report IAW ECG Section 11.10.2

Technical Reference(s) AB-CONT-0005 (Attach if not previously provided)
ECG Section 6.4.2.b

Proposed references to be provided to applicants during examination: ECG – not the attachments

Learning Objective: ABCNT5E007 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New x

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 1

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	295019 AA2.02	
	Importance Rating		3.7

Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Status of safety-related instrument air system loads

Proposed Question: SRO 78

Hope Creek is operating at 100% power when an Instrument Air line in the Turbine Building ruptures. The air compressors are unable to keep up with the loss of air and Instrument Air pressure is lowering.

The operators insert a manual scram.

What will the Reactor Pressure Vessel (RPV) level control and pressure control strategy be for the loss of Instrument Air?

A. IAW EOP-101 "RPV Control", SRVs for pressure control, HPCIIRCIC for level control.

B. IAW EOP-101 "RPV Control", SRVs for pressure control, Maximize CRD for level control.

C. IAW AB.ZZ-0000 "Reactor SCRAM", Bypass Valves for pressure control, HPCIIRCIC for level control.

D. IAW AB.ZZ-0000 "Reactor SCRAM", Bypass valves for pressure control, Maximize CRD for level control.

Proposed Answer: A

Explanation (Optional):

A CORRECT - Outboard MSIVs will go closed on a loss of air, therefore NO steam for feedpumps or use of the main condenser for decay heat. Condensate will be unavailable due to NO feedpath on a loss of air.

B INCORRECT - CRD flow control valves fail closed on a loss of air

C INCORRECT - Condenser is NOT available for pressure control

D INCORRECT - Condenser is NOT available and NO condensate line up is possible due to level control valves fail closed on a loss of air.

Technical Reference(s): EOP-101 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: INSAIRE016 (As available)

Question Source: Bank # INPO 25895

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam 2005

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	295025 G2.1.23	
	Importance Rating		**4.4**

(K&A Statement) Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of operation. (High Reactor Pressure)

Proposed Question: SRO 79

The plant is operating at 22% power when an EHC failure raises RPV pressure to 1052 psig. The following events occur:

- Main Turbine trips
- Mode Switch locked in the Shut Down position
- Scram Air header pressure lowers to 72 psig
- NO control rod motion

Which one of the following EOP entries correctly describes the required operator action(s) and the basis for the action(s)?

A. Enter EOP-101A ATWS-RPV Control because the SDV is full.

B. Enter EOP-101A ATWS-RPV Control because manual ARI is required.

C. Enter EOP-101 Reactor Pressure Vessel Control because a scram reset is required.

D. Enter EOP-101 Reactor Pressure Vessel Control because the Main Turbine is tripped.

Proposed Answer: B.

Explanation (Optional):

B. Correct – EOP-101 is initially entered on RPV press >1037 psig, but with the Mode Switch in SD and all rods not in the SRO must transition to EOP-IOIA, where the verification of ARI is the next step (the Turbine has already tripped).

A. Incorrect – EOP-IOIA is entered because the rods did not fully insert, additionally scram air header pressure has not lowered therefore the SDV Vents and Drains are open, there is no confirmation in the question stem that the SDV is full.
C. Incorrect – A scram reset is not required at this time because scram air pressure has not lowered (failure to scram), additionally EOP-101 is exited and EOP-IOIA is entered.
D. Incorrect – The turbine tripping is not an entry condition into EOP-101, additionally EOP-101 is exited and EOP-IOIA is entered.

Technical Reference(s): EOP-101A (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: EA101AE002 (As available)

Question Source: Bank # ID: Q56465
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41
55.43 5

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	WA #	295026 G2.1.7	
	Importance Rating		4.7

Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (Suppression Pool High Water Temperature)

Proposed Question: SRO 80

While operating at 60% Reactor power, a Reactor Scram on low reactor water level occurs but all rods remain at their pre-trip conditions.

Plant conditions thirty minutes after the transient start are:

- SLC tank level 2600 gal
- Rx power <4 %
- RPV pressure 900 psig being controlled using SRVs
- RPV level Intentionally lowered to -135 inches and steady
- Suppression pool level 79 inches
- Suppression pool temp 185°F and rising at 1°F/5 min
- Drywell pressure 4.5 psig
- Main steam tunnel temperature 170°F and rising at 1°F/2 min

Which one of the following is required for the conditions above?

A. Maintain RPV water level between +54" and -185".

B. Bypass interlocks to open the MSIV's and reduce RPV pressure.

C. Reduce RPV pressure to prevent exceeding the Heat Capacity Temperature Limit curve.

D. Emergency Depressurize to prevent exceeding the Pressure Suppression Pressure curve.

Proposed Answer: C

Explanation (Optional):

C. Correct - HCTL limit is being approached and will reach Action Required line within 15 minutes. RPV pressure must be reduced to move away from limit.

A. Incorrect - Wrong level band. Upper end of band limited to - 50 inches with an ATWS.

B. Incorrect - Incorrect action based on evidence of leak in the Main Steam Tunnel.
D. Incorrect - Action to be taken if RPV pressure cannot be lowered.

Technical Reference(s) EOP-102, 101A (Attach if not previously provided)

Proposed references to be provided to applicants during examination: SCP-L, SPT-P

Learning Objective: EO101AE008 (As available)

Question Source: Bank # 55997
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comtnents:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	295031 G2.4.3	
	Importance Rating		3.9

(K&A Statement) Emergency Procedures / Plan: Ability to identify post-accident instrumentation. (Reactor Low Water Level).

Proposed Question: SRO 81

A plant event has occurred. RPV level is +20" and lowering. You are informed by I & C that the following level instruments are inoperable.

- Fuel Zone Range Level Recorder LR-R615
- Upset Range Level Recorder LR-R608

Which one of the following sections of Technical Specifications must be entered for these inoperable instruments once plant conditions stabilize?

A. 3.3.7.5, Accident Monitoring Instrumentation ONLY

B. 3.3.4, Recirculation Pump Trip Actuation Instrumentation ONLY

C. 3.2.1, Isolation Actuation Instrumentation and 3.3.3 Emergency Core Cooling Actuation Instrumentation ONLY

D. 3.3.7.5 Accident Monitoring Instrumentation and 3.3.3 Emergency Core Cooling Actuation Instrumentation ONLY

Proposed Answer: A.

Explanation (Optional):

A. Correct – The fuel zone instruments provide post accident indication only

B. Incorrect - These TS instruments apply to normal and wide range instruments.
C. Incorrect - These TS instruments apply to normal and wide range instruments.
D. Incorrect - These TS instruments apply to normal and wide range instruments.

Technical Reference(s): T.S. 3.3.7.5 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: RXINSTE021 (As available)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____

Comprehension or Analysis X

10 CFR Part 55 Content: 55.4.1 _____

55.43 2

Comments:

NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	295028 EA2.03	
	Importance Rating		3.9

Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE: Reactor water level

Proposed Question: SRO 82

Given the following conditions:

- A Large Break LOCA has occurred in the Drywell concurrent with a LOP
- Only "C" EDG is running
- All control rods are fully inserted
- Wide Range RPV level indicator LR-623A is reading +20 inches
- Wide Range RPV level indicator LR-623B is reading -55 inches
- Drywell pressure is 29 psig and rising
- Drywell temperature is 300 F and rising
- Reactor pressure is 25 psig and steady
- Suppression Pool Level is 80 inches and rising
- Suppression Chamber pressure is 30 psig and rising
- "C" RHR Pump has been injecting LPCI flow for 3 minutes

Based on the above conditions, which one of the following actions is required?

A. Continue LPCI injection and enter EOP-206 "RPV Flooding".

B. Continue LPCI injection and continue in EOP-101 "RPV Control" in all control legs.

C. Stop LPCI injection, Emergency Depressurize IAW EOP-202, and then resume LPCI injection.

D. Continue LPCI injection, Emergency Depressurize IAW EOP-202, and then enter EOP-206 "RPV Flooding".

Proposed Answer: A

Explanation (Optional): with High drywell temps and low RPV pressure, per EOP caution 1 level is unreliable. Therefore it is not known and RPV flooding is required

A. Correct. Level is unknown due to unreliability of level instruments with high drywell temperature. RPV flooding is required. LPCI injection would continue

B. Incorrect. RPV flooding is required. Pressure Control Leg of 101 is exited when 206 is required.
C. Incorrect. Would not stop LPCI injection
D. Incorrect. ED already performed, RPV flooding required

Technical Reference(s) EOP-102 retainment step (Attach if not previously provided)
EOP caution 1

Proposed references to be provided to applicants during examination: Caution 1

Learning Objective: EOP206E008 (As available)

Question Source: Bank # 56161
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41
55.43 5

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	295033 EA2.01	
	Importance Rating		3.9

EA2.01 -Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: Area Radiation levels

Proposed Question: SRO 83

The plant is operating at rated power

A Backwash of Clean-Up Filter Demineralizer AF-203 has just been completed. Transfer of the RWCU Backwash Receiver Tank to Radwaste is in progress. A catastrophic failure of Backwash Transfer pump 1AP-214 suction line causes a spill into the Reactor Building. All attempts to isolate the leak have been unsuccessful.

Reactor Building Area Radiation conditions are as follows:

Reactor Building Area Radiation Monitor	Beginning of Shift	Current Conditions
9RX706 Reactor Cleanup Demin. Sys. Equipment	2 mr/hr	2400 mr/hr - In Alarm
9RX723 Outside Reactor Bldg. Sample Station	3 mr/hr	1100 mr/hr - In Alarm
9RX708 Sample Station	3.5 mr/hr	4500 mr/hr - In Alarm
Other Reactor Building Area Radiation Monitors	2 to 5 mr/hr	3 to 7mr/hr - NOT In Alarm

Which one of the following is the required action?

A. Commence a normal reactor shutdown to cold shutdown IAW IO.ZZ-0004.

B. Continue reactor operation and attempt to stop the tank drain line leakage IAW SO.BG-0001.

C. IAW EOP-010314, Runback Recirc, Initiate a Manual Scram and Emergency Depressurize the RPV.

D. IAW EOP-010314, Runback Recirc and Initiate a Manual Scram. Emergency Depressurization is NOT required.

Proposed Answer: A

Explanation (Optional): RWCU Backwash Receiving tank is not a primary System, with 2 areas > Max Safe Operating Limit, Plant shutdown and cooldown per 10-004 is applicable.

A. Correct.

B. Incorrect. Per EOP 103/4 and since the leak is not from a primary system, plant shutdown and cooldown applies
C. Incorrect. Only applicable for a primary system leak
D. Incorrect. Only applicable for a primary system leak

Technical Reference(s) EOP 10314 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: EOP 103 no entrys no retainment steps

Learning Objective: EOP103E006 (As available)

Question Source: Bank # 54264
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41
55.43 5

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	295017 G2.4.21	
	Importance Rating		4.6

Emergency Procedures / Plan: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

Proposed Question: SRO 84

Given the following conditions:

- A High Off-site release event is in progress
- Various RMS points are indicating elevated values but less than the RM-1▮ ALERT values
- The Iodine release rate must be determined

Which of the following describes the procedure to be entered and the method used to determine the total release rate?

A. Enter AB.CONT-0004 “Radioactive Gaseous Release". Use RMS values for all inputs to the release rate formula.

B. Enter AB.CONT-0004 "Radioactive Gaseous Release". Use RMS values for FRVS and HTV. An Iodine sample must be taken for the NPV and SPV.

C. Enter OP-AR.SP-0001 "Radiation Monitoring System Alarm Response". Samples must be taken for all inputs to release rate formula.

D. Enter OP-AR.SP-0001 "Radiation Monitoring System Alarm Response". Use RMS values for the NPV, SPV, and FRVS. An Iodine sample must be taken for the HTV.

Proposed Answer: A

Explanation (Optional): IAW AB.CONT-0004 , OP-AR.SP-0001 may be entered but the parameters are specified in the abnormal

A. CORRECT - The FRVS, NPV, SPV & HTV sample skids all have Iodine Monitors that can be used for the calculation.

B. INCORRECT - The NPV and SPV have iodine monitors and sampling is not specified in

the procedure.

C. INCORRECT - The NPV, SPV & HTV sample skids all have Iodine Monitors that can be used for the calculation. Samples are not required for those values.

D. INCORRECT - The FRVS sample skid does not have an Iodine Monitor so a sample must be taken. The HTV sample skid has an Iodine Monitor.

Technical Reference(s) AB.CONT-0004 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ABCNTE005 (As available)

Question Source: Bank # 64416
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 4

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	295015 G2.4.30	
	Importance Rating		4.1

Emergency Procedures / Plan: Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as State, the NRC, or the transmission system operator (incomplete scram)

Proposed Question: SRO 85

The plant was operating at 100% when an existing leak in the drywell worsened.

The operators scrammed the plant prior to reaching the High Drywell Pressure scram setpoint.

The following conditions now exist:

- Two peripheral control rods are at position 48
- ALL APRM downscale lights are lit
- Drywell Pressure is 1.80 psig and slowly rising
- RPV level is +20 inches and slowly rising
- RPV pressure is 910 psig

Which one of the following describes the NRC notification required?

A. 50.72 - 1 Hour Report

B. 50.72 - 4 Hour Report

C. Alert

D. SAE

Proposed Answer: C

Explanation (Optional): ECG Section 5.1.2.b manually initiated scram unsuccessful = Alert

C. Correct

A. Incorrect. Does not meet ECG Section 11.1 for 1 hour reports
B. Incorrect. Correct for actuation of RPS ONLY - ECG 11.3.2
D. Incorrect. Correct only if power remained about 4%

Technical Reference(s) ECG section 5.1.2.b (Attach if not previously provided)

Proposed references to be provided to applicants during examination: ECG, no attachments

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part *55* Content: 55.41 _____
55.43 1

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	206000 2.2.37	
	Importance Rating		4.6

Equipment Control: Ability to determine operability and/or availability of safety related equipment. (HPCI)

Proposed Question: SRO 86

Given the following:

- The plant is operating at 100% reactor power.
- HPCI Pump ISI test is in progress at rated flow.
- HPCI discharge pressure is 1150 psig.
- While attempting to adjust pump flow, the flow controller setpoint remains stationary at 4000 gpm in AUTO.
- The PO reports the HPCI flow controller works in MANUAL and develops rated flow.

What effect does this have on HPCI Operability at the PRESENT time?

A. HPCI is operable because it can develop rated flow.

B. HPCI is "operable but degraded" because it has lost its testing capacity.

C. HPCI is inoperable because it is NOT capable of meeting all surveillance requirements.

D. HPCI is "operable but non-conforming" because it is NOT capable of meeting all surveillance requirements.

Proposed Answer: C

Explanation (Optional): TS 3.5.1

C. Correct – HPCI must be in AUTO with a setpoint of 5600 gpm and capable of rated flow and discharge pressure.

C. Correct.

A. Incorrect – It must develop rated flow in AUTO

B. Incorrect – The case could be made if flow in AUTO remained stationary at 5600 gpm.

D. Incorrect - operable but non-conforming does not apply with flow at 4000 gpm in AUTO.

Technical Reference(s) TS 3.5.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: HPCI00E018 (As available)

Question Source: Bank # _____
Modified Bank # 55949 (Note changes or attach parent)
New _____

Question History: Last NRC Exam 2003

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 2

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	209001 G2.2.40	
	Importance Rating		4.7

Equipment Control: - Ability to apply Technical Specifications for a system.

Proposed Question: SRO 87

The plant is operating at rated power. The following alarm is then received:

- B3-C1 "CORE SPRAY LOOP A TROUBLE"

I&C Technicians report that 1-BE-PT-N054A, Core Spray Loop A Header Pressure transmitter is failed.

Which one of the following describes the Technical Specification action time(s) of this failure?

A. Declare Core Spray Loop A inoperable within 24 hours.

B. Declare Core Spray Loop A inoperable within seven days.

C. Restore the transmitter to operable status within thirty days and verify Core Spray Loop A pressure is less than 475 psig every 24 hours.

D. Restore the transmitter to operable status within seven days or verify Core Spray Loop A pressure is less than 475 psig every 12 hours.

Proposed Answer: D

Explanation (Optional):

D Correct: Restore to operable status within seven days or verify Core Spray Loop A pressure less than 475 psig every 12 hours for thirty days. T.S. 3.5.1, Action f. including *. Then T.S. 3.4.3.2, Action d. The stated transmitter feeds both Hi-Lo pressure interface alarm and Keepfill low pressure alarm.

A. Incorrect. Declare CS loop A inoperable within 24 hours. Not required if pressure verified every 12 hours.

B. Incorrect: Declare CS loop A inoperable within 7 days. 30 days to restore provided

pressure verified every 12 hours.

C. Incorrect: Restore to operable within 30 days or verify pressure less than 475 every 24 hours. Verify every 12 hours.

Technical Reference(s) TS3.5.1. & 3.4.3.2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: TS 3.5.1 & 3.4.3.2, Table 3.3.3-1 edited with action page M-52 Sht.1

Learning Objective: CSSYS0E014 (As available)

Question Source: Bank # 55139
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 2

Comments:
Provide additional TS references, maybe add additional components OOS

Provide additional TS Table 3.3.3-1 with 2,3,4 removed – makes A a credible distractor. Also provide 3.3.3-1 ACTION page

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	211000 G2.4.47	
	Importance Rating		4.2

Emergency Procedures / Plan: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.(SLC)

Proposed Question: SRO 88

Given the following:

- A feedwater line break in the drywell has occurred
- Reactor Power is 3.5% and steady
- Reactor Pressure is cycling between 800 to 1000 psig
- RPV level is -100 inches and lowering at 1" per minute
- HPCI is in service
- Drywell Pressure is 3.8 psig and rising at 0.1 psig per minute
- Drywell Temperature is 168 degrees F and rising at 3 degrees per minute
- Suppression Pool Temperature is 112 degrees and rising at 4 degrees per minute

Assuming the trends continue as above and all systems are operable, which one of the following is/will be required?

A. Immediately lower RPV Level until it reaches -129" IAW EOP-101A "ATWS-RPV Control"

B. Inject SLC before 7 minutes has elapsed IAW EOP-101A "ATWS-RPV Control"

C. Emergency Depressurize in 5 minutes IAW EOP-202 "Emergency Depressurization"

D. Terminate & Prevent Injection in 6 minutes IAW EOP-101A "ATWS-RPV Control", once that is complete Emergency Depressurize IAW EOP-202 "Emergency Depressurization"

Proposed Answer: B

Explanation (Optional): IAW EOP-101A

B. Correct – in 7 minutes, SP temperature will be 140 degrees. IAW the EOP101A, Step RC/Q-10, SLC must be injected before SP temp reaching 140 degrees

A. Incorrect. With power <4%, level is not lowered

C. Incorrect. No parameters will have met the ED requirement

D. Incorrect. Terminate & Prevent would occur only if level could not be maintained above --185 inches

Technical Reference(s) EOP-101A (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: EO101AE006 (As available)

Question Source: Bank # ____
Modified Bank # ____ (Note changes or attach parent)
New X

Question History: Last NRC Exam ____

Question Cognitive Level: Memory or Fundamental Knowledge ____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 ____
55.43 5

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	205000, 2.2.22	
	Importance Rating		4.7

(K&A Statement) Equipment Control: Knowledge of limiting conditions for operations and safety limits. (Shutdown Cooling)

Proposed Question: SRO 89

The plant is 3 days into a shutdown. Reactor cavity level is 23 feet above the RPV head flange.

Which one of the following is the minimum Shutdown Cooling systemslcomponents required by Technical Specifications for these conditions.

A. One loop of Shutdown Cooling, each consisting of one OPERABLE RHR pump and one OPERABLE RHR Heat Exchanger in operation. The other loop may be IIVOPERABLE.

B. One loop of Shutdown Cooling, each consisting of one OPERABLE RHR pump and one OPERABLE RHR Heat Exchanger in operation. The other loop must be OPERABLE.

C. Two loops of Shutdown Cooling OPERABLE and one Recirculation Pump in operation.

D. NO Shutdown Cooling loops OPERABLE and one Recirculation Pump in operation.

Proposed Answer: A

Explanation (Optional):

A. Correct - IAW T/S 3.9.11.1

B. Incorrect – this would be correct for low water level TS 3.9.11.2
C. Incorrect – not correct for given conditions, not the minimum.
D. Incorrect – this is the action requirements for TS 3.4.9.2

Technical Reference(s): T.S. 3.9.11.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: IOP009E006 (As available)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____

55.43 2

Comments:

Changes above to distractors A & B.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	215004 A2.02	
	Importance Rating		3.7

(K&A Statement) Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR ; and **(b)** based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: SRM inop condition

Proposed Question: SRO 90

Given the following conditions:

- Refueling is in progress with 550 fuel bundles remaining in the vessel.
- The Reactor Mode Switch is locked in REFUEL.
- Source Range Monitors A, B, and C are operable.
- SRM D is inoperable and bypassed.
- Shutdown margin has been verified.
- All control rods are at position 00.

With the refueling platform unloaded over the vessel, the count rate on SRM 'B' drops to 1.5 cps.

Core Alterations…

A. are permitted in quadrants A and C ONLY.

B. can continue if NO fuel movement occurs.

C. must be formally suspended.

D. can continue with NO restrictions.

Proposed Answer: C

Explanation (Optional):

B. Correct – IAW Tech Specs 3.9.2.b , For core alterations to be permitted - One of the required SRM detectors located in the quadrant where CORE ALTERATIONS are being performed and the other required SRM detector located in an adjacent quadrant.

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS.

In this situation there are no adjacent SRMs operable, the T.S. LCO cannot be met and core alterations must be formally suspended IAW 10-0009.

A. Incorrect – The TS conditions for core alterations are not met
B. Incorrect – No core alterations are permitted.
D. Incorrect - No core alterations are permitted.

Technical Reference(s): IO.ZZ-0009 (Attach if not previously provided)
TS3.9.2.b

Proposed references to be provided to applicants during examination: none

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # 54838 (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 2

Comments:
May not meet KA – add a battery bus that feeds the ADS valves has failed for 10 minutes
1-9-08 - replaced with Modified bank question 54838. Randomly selected KA 215004 A2.02

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	245000 A2.02	
	Importance Rating		3.5

Ability to (a) predict the impacts of the following on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of lube oil

Proposed Question: SRO 91

The plant was operating at 100% power in a normal system alignment when a steam leak in the Drywell causes pressure to rise. The Reactor is shutdown prior to Drywell pressure reaching 1.68 psig and all SCRAM actions are carried out by the RO.

Ten minutes after the scram the following conditions exist:

- Drywell Pressure is 2.1 psig and slowly rising
- RPV level is -40" and rising, with HPCI and RCIC injecting
- RPV pressure is 800 psig and lowering slowly
- Turbine Speed is 200 RPM and lowering

The field operator reports all Lift Pumps and the Turning Gear Oil Pump are NOT running.

Which one of the following describes the plant response and actions required, if any?

A. The TGOP failed to AUTO start and must be manually started to allow the Lift Pump to start IAW HC.OP-AB.BOP-0002 "Main Turbine".

B. The Lube Oil system has an apparent leak causing the TGOP and lift pumps to trip. The NEO should be sent to investigate IAW HC.OP-SO.CB-0001 "Main Turbine and Generator Lube Oil System Operation".

C. The plant responded as designed due to the High Drywell pressure. The operator must verify the EBOP is running IAW the overhead alarm response for window C8-F3, Digital Point D5573, "Turning Gear Oil Pump Trouble".

D. The plant responded as designed due to the Main Turbine speed coasting down. The operator must verify the TGOP and Lift Pumps start when Turbine speed reaches < 100 RPM IAW HC.OP-SO.CB-0001 "Main Turbine and Generator Lube Oil System Operation".

Proposed Answer: C

Explanation (Optional):

C. Correct-: IAW HC.OP-SO.SM-0001 the 10B323 load center is stripped on a LOCA 1 signal the TGOP is de-energized resulting in the Lift pumps tripping. Therefore the EBOP must be verified as running for the turbine lube oil system IAW the alarm response procedure.

A. Incorrect- IAW HC.OP-SO.SM-0001 the 10B323 load center is stripped on a LOCA 1 signal the TGOP is de-energized.
B. Incorrect- without the TGOP running and suction pressure > 1 psig the Lift pumps trip.
D. Incorrect- the LIFT pumps and TGOP due not rely on Turbine speed for a start signal, the TGOP starts on pressure and the lift pump starts on the TGOP and > 1 psig suction pressure.

Technical Reference(s) HC.OP-AB.BOP-0002 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: MTLO00E011 (As available)

Question Source: Bank # 56902
Modified Bank # (Note changes or attach parent)
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41
55.43 5

Comments:
See above

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	202001 G2.4.49	
	Importance Rating		4.4

Emergency Procedures / Plan: Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (recirculation)

Proposed Question: SRO 92

The plant is operating at 100% power, when a lighting strike caused the " A Reactor Recirc pump to trip, the "B" Reactor Recirc Pump to runback to it's intermediate speed and isolation of 6A FW Heater. All other plant equipment is operable.

Currently Rx power is 56% and Core flow is 41%.

Which of the following describes the action required, if any, to ensure core stability?

A. Unintentional operation in this region is allowed for 1 hour.

B. IAW OP-SO.BB-0001 "Recirculation System Operation", start the " A Reactor Recirc Pump to exit this region.

C. Exit the current region using Enhanced Stability Guidance IAW OP-AB.RPV-0003 "Recirculation System/Power Oscillations".

D. Immediately lock the mode switch in shutdown IAW OP-AB.RPV-0003 "Recirculation System/Power Oscillations".

Proposed Answer: C

Explanation (Optional): HC.OP-AB.RPV-0003

C. Correct - Insert control rods IAW RE guidance to exit this region.

A. Incorrect Unintentional operation in this region is not allowed, immediately Lock the Mode Switch in Shutdown. Incorrect – Mode switch is not required Locked in Shutdown and rod insertion is method to exit this region

B. Incorrect - Start the "A" Reactor Recirc pump to exit this region - Starting an idle Recirc pump to exit this region is NOT IAW with the AB.

D. Incorrect - Unintentional operation in this region is allowed, no further actions are required. Unintentional operations in this region are not allowed and actions to exit this region are required.

Technical Reference(s) HC.OP-AB.RPV-0003 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Power–to-flow map OPRMs operablelinoperable – reference does not state the action required but is needed to determine the action

Learning Objective: IOP003E005 (As available)

Question Source: Bank # 56978
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comments:
Revise A & C

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	215001 A2.07	
	Importance Rating		3.7

Ability to (a) predict the impacts of the following on the TIPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure to retract during accident conditions

Proposed Question: SRO 93

A Traversing Incore Probe (TIP) trace is in progress on the " A drawer when a high drywell pressure event (> 1.68 psig) occurs due to a leak in the recirculation system. Three minutes following the event, the Reactor Operator reports the following indications on the TIP Valve Control Monitor:

- "SQUIB MONITOR" lights - both illuminated
- "SHEAR VALVE MONITOR lights - both extinguished
- "BALL VALVE OPEN" lights - both illuminated
- "BALL VALVE CLOSED" lights - both extinguished

Which of the following describes the status of the TIP system, the next required operator action(s), if any, and status of Primary Containment Isolation (in regard to TIPS ONLY)? (Assume NO operator actions have been taken)

A. The system has responded as designed. Operator action is required to close the ball valves IAW OP-SO.SE-0002 "TIP System Operation", to ensure Primary Containment isolation.

B. The system has responded as designed. IAW OP-SO.SE-0002 "TIP System Operation", direct the operators to fire the shear valves to ensure Primary Containment has been isolated.

C. The TIP detectors may NOT have withdrawn. IAW OP-AB.CONT-0002, Withdraw the detectors and verify the ball valves close. Primary Containment will be isolated once the ball valves are closed.

D. The TIP detectors may NOT have withdrawn. IAW OP.AB-CONT-0002, Fire the shear valves, withdraw the detectors and then close the ball valves. Primary Containment is considered isolated ONLY after the ball valve has closed and shear valve has fired.

Proposed Answer: C

Explanation (Optional):

C. Correct: The ball valve should be closed. A failure to auto retract could be the problem. The next action would be to attempt to withdraw the detectors and verify the ball valve

closes.

A. Incorrect: Did not respond as designed. The ball valve should be closed.
B. Incorrect: The system did not respond as designed. The ball valve should be closed. Primary Containment is not isolated.
D. Incorrect: The next action is to attempt a manual withdrawal and close the ball valve. The squib valves have lost continuity and will not fire. Primary Containment Isolation will occur once the ball valves are closed.

Technical Reference(s) IAW OP.AB-CONT-0002 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: ABPRCUE003 (As available)

Question Source: Bank # __
Modified Bank # NRC 2007 (Note changes or attach parent)
New

Question History: Last NRC Exam 2007

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41
55.43 5

Comments:
Changed stem

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		1
	K/A #	G2.1.35	
	Importance Rating		3.9

Knowledge of refueling responsibilities of SRO

Proposed Question: SRO 94

Plant conditions are as follows:

- The Reactor Vessel is prepared for refueling operations IAW "Cold Shutdown to Refueling", HC.OP-IO.ZZ-0005.
- Prerequisite plant conditions have been verified IAW "Refueling Operations" HC.OP-IO.ZZ-0009.
- Spiral Fuel offload is in progress per directions of Reactor Engineers and Fuel Handling Control Core Alteration forms HC.RE-FR.ZZ-0001.
- Multiple Control Rod blades and drive mechanisms are being removed IAW Technical Specification 3.9.10.2

Then, Reactor Engineering reports Shutdown Margin CANNOT be demonstrated.

Which of the following are required?

A. Stop fuel handling in the fuel pool and return the Control Rod Blades to the reactor vessel.
Then, remove the shorting links prior to resuming any fuel or Control Blade movement.

B. Stop Control Rod Blade removal from the reactor vessel. Fuel handling in the fuel pool may continue.
Control Rod Blade removal from the reactor vessel may continue once the shorting links are removed.

C. Stop fuel handling in the fuel pool and return the Control Rod Blades to the reactor vessel.
Then, install the shorting links prior to resuming either of the above activities.

D. Stop Control Rod Blade removal from the reactor vessel. Fuel handling in the fuel pool may continue.
Control Rod Blade removal from the reactor vessel may continue once the shorting links are installed.

Proposed Answer: B

Explanation (Optional): B. Correct

B. Correct. T.S. action 3.1.1 c requires suspension of Core Alterations and other activities that could reduce the Shutdown margin, and insert all insert able control rods. Returning CRBs to the RPV would be Core Alterations (as defined in TS)
TS 3.9.10.2.c both require SDM demonstration or suspend control rod removal
T.S. 3.9.2.c allows RPS shorting Link removal in place of SDM demonstration, or suspend all Core Alterations and insert all insert able control rods.

A. Incorrect- Fuel Pool fuel handling is allowed.
C. Incorrect. Shorting links must be removed. Fuel Pool fuel handling is allowed
D. Incorrect. Shorting links must be removed.

Technical Reference(s) HC.OP-IO-ZZ-0009 (Attach if not previously provided)
TS 3.9.10.2, 3.1.1

Proposed references to be provided to applicants during examination: None

Learning Objective: IOP009E006 (As available)

Question Source: Bank # 76882
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 2, 7

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	G2.2.7	
	Importance Rating		3.6

Knowledge of the process for conducting special or infrequent tests.

Proposed Question: SRO 95

Given the following conditions:

The plant is in Operational Condition 1. It's been determined that work must be performed on the 6A Feedwater Heater level controller. It has been determined that the work could result in an unplanned load reduction of 40 MWe.

This evolution is…

A. a production risk activity and an IPTE brief is required.

B. a production risk activity and a HLNIPA brief is required.

C. NOT a production risk activity but an IPTE brief is still required.

D. NOT a production risk activity but an HLNIPA brief is still required.

Proposed Answer: B

Explanation (Optional): IAW WC-AA-104 – Step 2.4 defines production risk activity as >20 MWe. Then an HLNIPA

B. Correct
A. Incorrect - an HLA/IPA briefing is required. IPTE briefings are no longer performed for these evolutions.
C. Incorrect – this is a production risk activity, an HLNIPA briefing is required.
D. Incorrect - this is a production risk activity. IPTE briefings are no longer performed for these evolutions.

Technical Reference(s) OP-AA-108-110 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: OPSBRIEFE005 (As available)

Question Source: Bank # _____
Modified Bank # ___ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 3

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		3
	K/A #	G2.2.18	
	Importance Rating		3.9

Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.

Proposed Question: SRO 96

The plant is in Cold Shutdown for a forced outage.

You are approving work to be performed during the outage.

Which one of the following describes an example of systems/components which would become an "Operation With Potential To Drain The Reactor Vessel" (OPDRV) if NOT isolated by a barrier IAW HC.OM-AP.ZZ-0001 "Shutdown Safety Management Program"?

A. SRVs

B. HPCI

C. RPV Instrumentation

D. Reactor Water Cleanup

Proposed Answer: D

Explanation (Optional): HC.OM-AP.ZZ-0001 Step *7.2*

D. Correct.

A. Incorrect. This would be considered an Operation with a Potential for Draining the **Reactor Cavity as defined in step 7.3 of the procedure**

B. Incorrect. This would be considered an Operation with a Potential for Draining the **Reactor Cavity as defined in step 7.3 of the procedure**

C. Incorrect. This would be considered an Operation with a Potential for Draining the **Reactor Cavity as defined in step 7.3 of the procedure**

Technical Reference(s) HC.OM-AP.ZZ-0001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 2

Comments:
NC

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		4
	KIA #	G2.4.6	
	Importance Rating		4.7

Knowledge of EOP mitigation strategies.

Proposed Question: SRO 97

Given the following conditions:

- Reactor Power is at 6%
- Reactor Pressure is being controlled by SRV's at 950 psig
- Reactor Water Level is (-10) inches, slowly lowering
- Drywell Temperature is 355°F, and rising
- Drywell Pressure is 23 psig, and rising
- Suppression Pool Temperature is 115°F, and rising
- Suppression Pool Level is 85 inches, steady
- Suppression Chamber Pressure is 21.7 psig, and rising
- NO operator actions have been taken

Which one of the following action(s) is(are) required?

A. ONLY initiate Drywell Sprays IAW EOP-102.

B. ONLY initiate Drywell Sprays and Suppression Pool Cooling/Sprays IAW EOP-102.

C. Enter EOP-202 and Emergency Depressurize.

D. Place Suppression Pool Cooling/Sprays in service then Emergency Depressurize IAW EOP-202.

Proposed Answer: C

Explanation (Optional): C. Correct

IAW EOP-102 Step DWT-8, If DW temp cannot be maintained below 340 degrees F., ED is required.

C. Correct.

A. Incorrect. – ED is required

B. Incorrect. – ED is required

D. Incorrect. – All RPV injection must be secured prior to ED (EOP-202, step **ED-3)**

Technical Reference(s) EOP-102 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: EO102PE007 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comments:
Edit in stem

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		4
	K/A #	G2.4.40	
	Importance Rating		4.5

Knowledge of SRO responsibilities in emergency plan implementation

Proposed Question: SRO 98

An event has occurred at the plant. The TSC and EOF are manned and NOT activated.

IAW NC.EP-EP.ZZ-0102 "Emergency Coordinator Response", which one of the following describes the individual responsible for escalating an emergency event level from a SAE to a GE?

A. The Shift Manager

B. The Emergency Duty Officer.

C. The Emergency Response Manager.

D. The Site Vice President.

Proposed Answer: A

Explanation: The SM is the Emergency Coordinator until the TSC is ACTIVATED. Until then the SM (as the EC) is responsible for escalating an event

A. Correct.

B. Incorrect. Correct if the TSC was activated and the EOF manned

C. Incorrect. Correct if the EOF was activated

D. Incorrect. Site VP is not a designated EC

Technical Reference(s) NC.EP-EP.ZZ-0102 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: _____ (As available)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 1

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		3
	K/A #	G2.3.12	
	Importance Rating		3.7

Knowledge of Radiological Safety Principles pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.

Proposed Question: SRO 99

A Planned Special Exposure (PSE) is required today for a containment entry.

The individual involved and their supervisor have agreed to the PSE. The individual has never performed a PSE. Their lifetime dose is 2 Rem and has been fully documented.

Which one of the following describes the additional approvals required and the maximum dose that may be received IAW RP-AA-203 "Exposure Control and Authorization"?

A. The maximum dose permitted for the PSE is 3 Rem. It requires additional approvals by the RPM and Plant Manager ONLY.

B. The maximum dose permitted for the PSE is 23 Rem. It requires additional approvals by the RPM, Plant Manager and Site VP.

C. The maximum dose permitted for the PSE is 25 Rem. It requires additional approvals by the RPM and Plant Manager ONLY.

D. The maximum dose permitted for the PSE is 25 Rem. It requires additional approvals by the RPM, Plant Manager and Site VP.

Proposed Answer: D

Explanation (Optional): IAW RP-AA-203, Section 4.3

For a PSE, the max annual NRC limit is treated separately. Therefore 25 rem is permissible. It requires additional approvals by the RPM, Plant Manager and Site VP.

D. Correct.

A. Incorrect. If subtracting the lifetime dose (2 R) from the annual limit (5R) this would be correct. However the PSE is treated separately with a 25 R limit. Site VP is also required for approval .

B. Incorrect. If subtracting the lifetime dose (2 R) from the PSE this would be correct.

However the PSE is treated separately with a 25 R limit

C. Incorrect. Site VP is also required for approval.

Technical Reference(s) RP-AA-203, Section 4.3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: NOH04ADM024C-01 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
55.43 4

Comments:
See changes above on disctractor B

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		1
	K/A #	G2.1.34	
	Importance Rating		3.5

Knowledge of primary and secondary plant chemistry limits,

Proposed Question: SRO 100

Given the following conditions:

- A reactor shutdown is in progress.
- Power is currently 20%.
- Hydrogen Water Chemistry Injection (HWCI) is out of service.
- Main Steam Line RMS Setpoints are set High.
- 2 Condensate Demineralizers are in service at 3000 gpm each.
- Plant chemistry parameters are as follows:
  - Condensate demin influent conductivity is 0.21 uS/cm
  - Condensate demin effluent conductivity is 0.08 uS/cm
  - Reactor Water Cleanup conductivity is 0.07 uS/cm
  - Reactor coolant sample conductivity is 0.07 uS/cm
  - Reactor coolant specific activity is $1.0 X10^{-3}$ ucilgm Dose Equivalent Iodine

Based on these conditions, which one of the following would cause these indications and what actions must be taken IAW AB-RPV-0007 "Reactor Coolant Conductivity"?

A. Crud burst due to removing HWCI from service; restore HWCI to service.

B. Main Condenser tube leak; isolate the affected condenser waterbox.

C. Reactor fuel pin cladding leak; continue power reduction at normal rate.

D. Condensate Demineralizer channeling; remove one demineralizer from service.

Proposed Answer: B

Explanation (Optional):

B. Correct. Main Condenser tube leak; isolate the affected condenser waterbox. Conductivity into the Cond Demins is high. This is a symptom of a Condenser tube Leak. Required action would be to remove the waterbox IAW AB-RPV-0008.

A. Incorrect. Crud burst from removing HWCI from service; restore HWCI to service. RWCU and Reactor coolant conductivity levels are normal.

C. Incorrect. Reactor fuel pin cladding leak; continue power reduction at normal rate. Power reduction at normal rate not permitted due to MSL RMS setpoints are set high. Indications are not cause for emergency power reduction.

D. Incorrect. Condensate Demineralizer channeling due to low flow; remove one demineralizer from service. Demineralizer outlet conductivity is normal. Would have low inlet and high outlet conductivity.

Technical Reference(s) HC.OP-AB.RPV-0007 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: HWCI00E006 (As available)

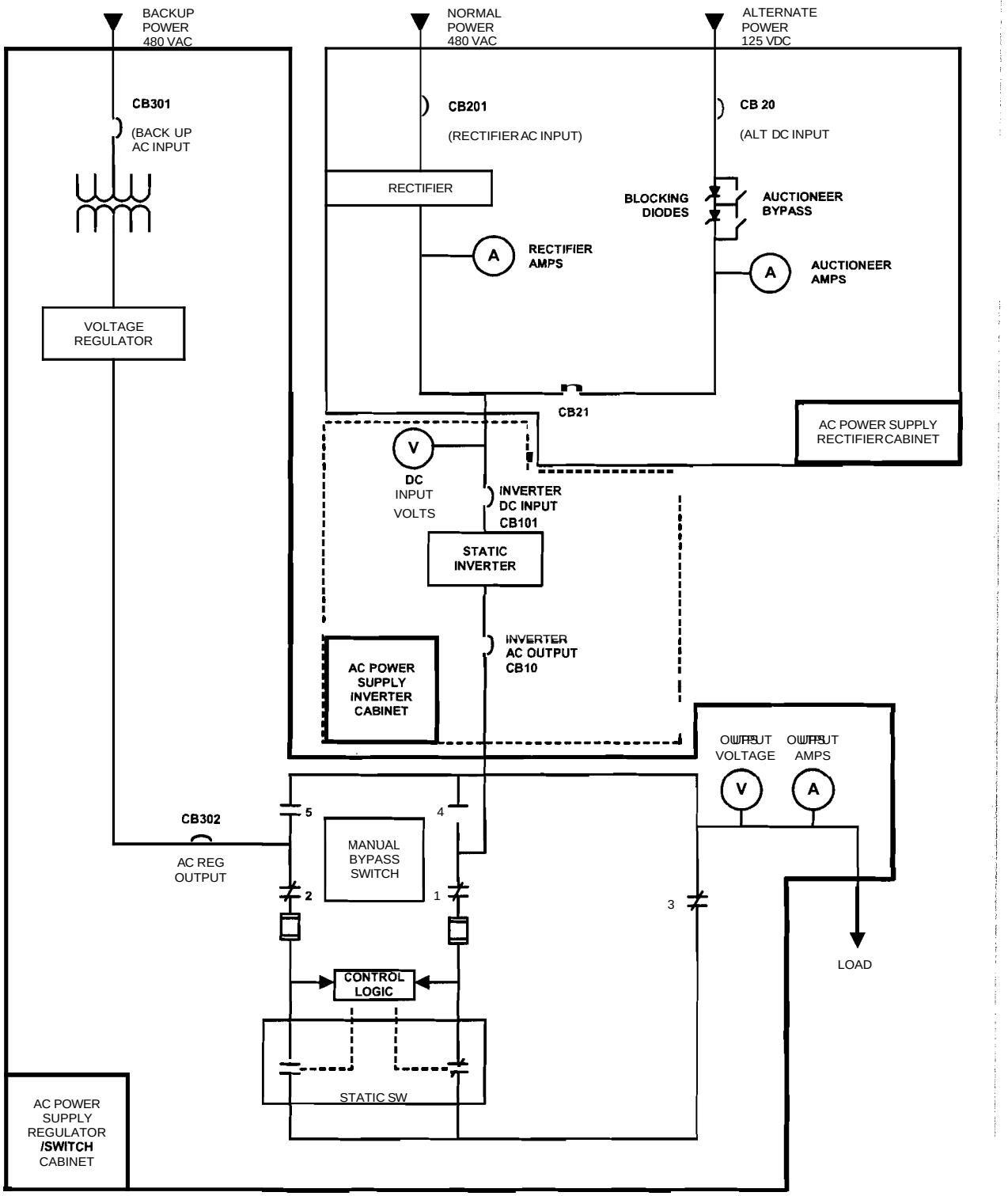
Question Source: Bank # 80628
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam 2003

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____
55.43 6

Comments:
NC


BACKUP POWER 480 VAC
NORMAL POWER 480 VAC
ALTERNATE POWER 125 VDC
CB301
(BACK UP AC INPUT
CB201
(RECTIFIER AC INPUT)
CB 20
(ALT DC INPUT
RECTIFIER
BLOCKING DIODES
AUCTIONEER BYPASS
A
RECTIFIER AMPS
A
AUCTIONEER AMPS
VOLTAGE REGULATOR
CB21
AC POWER SUPPLY RECTIFIER CABINET
V
DC INPUT VOLTS
INVERTER DC INPUT CB101
STATIC INVERTER
INVERTER AC OUTPUT CB10
AC POWER SUPPLY INVERTER CABINET
OUTPUT VOLTAGE
OUTPUT AMPS
V
A
CB302
AC REG OUTPUT
5
4
MANUAL BYPASS SWITCH
2
1
3
LOAD
CONTROL LOGIC
STATIC SW
AC POWER SUPPLY REGULATOR /SWITCH CABINET