Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	400000 K1.01	
	Importance Rating	3.2	

Knowledge of the physical connections and / or cause-effect relationships between CCWS and the following: Service water system

Proposed Question: RO Question # 1

The plant is operating at 100% power when the following occurs:

- A system piping failure in the Reactor Building Closed Loop Cooling System (CCP)
- A trip of all operating CCP pumps has occurred

Which one of the following identifies the components which can still be cooled using the service water system following the loss of CCP?

A. Drywell Unit Coolers

B. RDS Pump Seal Coolers

C. RHS Pump Seal Coolers

D. Drywell Equipment Drain Coolers

Proposed Answer: C

Explanation (Optional):

A. Incorrect - Drywell Unit Coolers are only cooled by RBCLC or the alternate drywell cooling system

B. Incorrect – RDS Pump Seal Coolers are only cooled by RBCLC or a temporary cooling water system during shutdown, not service water

C. Correct - RHS Pump seal coolers can also be supplied with Service Water.

D. Incorrect - Drywell Equipment Drain Coolers are only cooled by RBCLC

Technical Reference(s): PID-13 (Attach if not previously provided)

Proposed References to be provided to applicants during examination:			None
Learning Objective:			(As available)
Question Source:	Bank #	N2-208000-RBO-08-Q05	
	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	4	
	55.43		

Secondary coolant and auxiliary systems that affect the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	215003 K1.05	
	Importance Rating	3.3	

Knowledge of the physical connections and/or cause- effect relationships between INTERMEDIATE RANGE MONITOR (IRM) SYSTEM and the following: Display control system: Plant-Specific

Proposed Question: RO Question # 2

In accordance with N2-OP-92, Neutron Monitoring, which one of the following describes the lineup for placing the IRMs controls and displays in service prior to a plant startup?

Place the IRM drawer switch to ____(1)____

-AND-

Place the IRM Recorders C51-R603A – D in ____(2)____ speed.

	(1)	(2)
A.	STANDBY	SLOW
B.	STANDBY	FAST
C.	OPERATE	SLOW
D.	OPERATE	FAST

Proposed Answer: D

Explanation (Optional):

A. Incorrect - The switch must be placed in OPERATE and recorders in FAST

B. Incorrect - The switch must be placed in OPERATE and recorders in FAST

C. Incorrect - The switch must be placed in OPERATE and recorders in FAST

D. Correct - OP-92 states "At H13-P606 place drawer switch to OPERATE and place C51-R603A – D in FAST speed."

Technical Reference(s): N2-OP-92, Section E.2.5 (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	6	
	55.43		

Design, components, and function of reactivity control mechanisms and instrumentation.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	203000 K2.03	
	Importance Rating	2.7	

Knowledge of electrical power supplies to the following: Initiation logic (RHR/LPCI Injection Mode)

Proposed Question: RO Question # 3

The plant is operating normally at rated power when a malfunction on 2BYS*PNL201B caused the following indications:

- System Status Light "RHR B Relay Logic power Fail" is lit.
- Annunciator 601601 "RHR C SYSTEM INOPERABLE" alarms.
- Annunciator 601631 "RHR B SYSTEM INOPERABLE" alarms.

Which one of the following describes the status of the RHR B and C pumps?

RHR B and C pumps..

A. can be manually started

B. are capable of auto starting

C. are not capable of auto starting and cannot be manually started

D. will start, but only after depressing the Manual Initiation pushbutton

Proposed Answer: A

Explanation (Optional):

A. Correct - The malfunction on 2BYS*PNL201B causes a loss of the Div 2 RHS Auto/Manual initiations as discussed in N2-SOP-04 Attachment 3. Loss of Div II RHS Auto/Manual Initiations. Annunciator 601601, RHR C SYSTEM INOPERABLE, and Annunciator 601631, RHR B SYSTEM INOPERABLE, in alarm

B. Incorrect - Cannot be automatically started per N2-SOP-04, Attachment 3

C. Incorrect - RHR B and C pumps can be manually started because control power to the breakers has not been lost, (i.e. loss of 2BYS*SWG002B)

D. Incorrect - Manual Initiation pushbutton will not cause the RHR B or C pumps to start per N2-SOP-04, Attachment 3.

Technical Reference(s): N2-SOP-04, Att 3, pg 27 (Attach if not previously provided)

ESK 5RHS02

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # WTSI 4250

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 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	262001 K2.01	
	Importance Rating	3.3	

Knowledge of electrical power supplies to the following: Off-site sources of power, (AC Electrical Distribution)

Proposed Question: RO Question # 4

The plant is operating at 100% power with the following conditions:

- Division III is lined up to Line 5
- An offsite power surge causes annunciator 852536,
  4KV BUS NNS 017 SPLY ACB 17-2 AUTO TRIP / FTC to alarm

Which one of the following describes the plant AC bus(es) immediately de-energized as a result of the above conditions?

A. 2ENS*SWG103 (Div. II)

B. 2ENS*SWG101 and 2ENS*SWG102 (Div I & III)

C. 2ENS*SWG101 (Div. I) and 2NNS-SWG014 (Stub Bus)

D. 2ENS*SWG103 (Div. II) and 2NNS-SWG015 (Stub Bus)

Proposed Answer: A

Explanation (Optional):

A. Correct - 2ENS*SWG103 (Div II) – NNS-SWG017 is the normal supply for this bus via offsite power

B. Incorrect - 2ENS*SWG101 and 2ENS*SWG102 (Div I & III) are normally supplied from NNS-SWG016 via offsite power

C. Incorrect - 2ENS*SWG101 (Div. I) is normally supplied from NNS-SWG016 and NNS-SWG014 (Stub Bus) is normally supplied from the NPS-SWG003

D. Incorrect – Although 2ENS*SWG103 (Div. II) is powered from NNS-SWG017, NNS-SWG015 (Stub Bus) is normally supplied from NPS-SWG003

Technical Reference(s):	N2-ARP-01, AN 852536		(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source:	Bank #		
	Modified Bank #	2008 AUDIT EXAM (LC2 06-01)	(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	4
	55.43	

Secondary coolant and auxiliary systems that affect the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	211000 K3.01	
	Importance Rating	4.3	

Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following: Ability to shutdown the reactor in certain conditions

Proposed Question: RO Question # 5

The plant has experienced a seismic event followed by a failure to scram. Conditions are as follows:

- 2SLS*P1A and P1B Standby Liquid Poison (SLC) pumps are not available due to motor electric faults
- 2SLS*MOV1A, STORAGE TANK OUTLET VLV is stuck shut and cannot be opened.

Per N2-EOP-6, which one of the following lineups will allow boron to be injected into the RPV to shutdown the reactor?

#	Lineup
1	Hydro Pump Born Injection via 2SLS*P1A Piping
2	Hydro Pump Born Injection via 2SLS*P1B Piping
3	Boron Injection Via WCS System

Lineup number...

A. 3 only

B. 1 or 3 only

C. 2 or 3 only

D. 1, 2, or 3

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Although injection via WCS is a method for injecting boron into the core, the SLS failure given in the question stem does not preclude using SLS B piping to also inject the boron. Plausible in that if the candidate does not know the lineup used to

inject boron via the hydro pump, they may think that the failure given in the question stem precludes the use of using the B SLS pump piping to inject boron.

B. Incorrect. The SLS failure given in the question stem does precludes using SLS A piping to inject the boron. Plausible if the candidate does not know that there are two methods allowed per Attachment 16 to inject boron using the hydro pump and that the suction valve is required to be open in order to use it.

C. Correct. The SLS failure given in the question stem precludes the use of SLS A to inject boron using the hydro pump. Since SLS B is still available, boron injection can be lined up via this train. Additionally, boron injection via WCS is still available.

D. Incorrect. The storage tank outlet valve for SLS A needs to be open in order to use the SLS A train to inject born via the hydro pump. Plausible in that if the candidate does not know the hydro pump suction connection comes off downstream of the storage tank outlet valve this would be the correct answer.

Technical Reference(s): N2-EOP-6, Attachment 16
PID-36A (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 6

55.43

Design, components, and function of reactivity control mechanisms and instrumentation.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	223002 K3.20	
	Importance Rating	3.3	

Knowledge of the effect that a loss or malfunction of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF will have on following: Standby gas treatment system

Proposed Question: RO Question # 6

The plant is operating at 100% power with GTS Train A running and aligned for containment venting via the drywell when the following occurs:

- Drywell pressure trip unit C72-N650A fails upscale
- 603101, RPS A DRYWELL PRESSURE HIGH TRIP annunciator alarms

Which one of the following lists (1) the GTS Train A response and (2) the GTS Train B response?

A. (1) GTS Train A will continue to run in containment vent mode via the drywell
   (2) GTS Train B will remain in standby

B. (1) GTS Train A will continue to run in containment vent mode via the drywell
   (2) GTS Train B will automatically initiate

C. (1) GTS Train A will continue to run, however CPS*AOV110, DRYWELL PURGE OUTLET OUTBOARD ISOL VLV closes
   (2) GTS Train B will remain in standby

D. (1) GTS Train A will continue to run, however CPS*AOV110, DRYWELL PURGE OUTLET OUTBOARD ISOL VLV closes
   (2) GTS Train B will automatically initiate

Proposed Answer: A

Explanation (Optional):

A. Correct – Because only one drywell trip unit failed, the primary containment vent valves only received a half isolation signal, (the vent valves are part of Group 9). The Group 9

isolation requires 2 out of 2 logic, (i.e. two drywell trip units must actuate) in order for either the inboard or outboard containment vent valves to close. Since no isolation occurred, GTS Train A will remain running in containment vent mode. Also GTS train B only receives a half initiate signal per ARP 603101. With only a half isolation in, GTS train B will not start.

B. Incorrect – Although GTS train A will continue to run, GTS train B only received a half initiation signal so it will not start.

C. Incorrect – AOV110 only received a half isolation signal, so it will not close. Two drywell pressure trip units would need to actuate in order to cause the valve shut.

D. Incorrect – AOV110 only received a half isolation signal, so it will not close. Two drywell pressure trip units would need to actuate in order to cause the valve shut and GTS Train B only received a half initiation signal so it will not auto start.

Technical Reference(s): ARP-603101, N2-OP-83 system description, and N2-OP-83, Attachment 2, page 11 of 13. (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	264000 K4.02	
	Importance Rating	4.0	

Knowledge of EMERGENCY GENERATORS (DIESEL/JET) design feature(s) and/or interlocks which provide for the following: Emergency generator trips (emergency/LOCA)

Proposed Question: RO Question # 7

The Standby Emergency Diesels automatically started following a loss of off-site power.

The thermostatic control valve regulating DG lube oil temperature associated with 2EGS*EG1 has failed causing all lube oil to bypass the lube oil cooler.

Lube oil temperature will rise until...

A. engine failure occurs

B. the diesel trips on high vibration

C. the diesel trips on high lube oil temperature

D. the diesel trips on high main bearing temperature

Proposed Answer: A

Explanation (Optional):

A. Correct: - Following an emergency start all trips are bypassed except overspeed and Generator Differential Current.

B. Incorrect: - Following an emergency start all trips are bypassed except overspeed and Generator Differential Current. Plausible in that this is an engine trip but which is bypassed during an emergency start.

C. Incorrect: - Following an emergency start all trips are bypassed except overspeed and Generator Differential Current. Plausible in that this is an engine trip but which is bypassed during an emergency start

D. Incorrect: - Following an emergency start all trips are bypassed except overspeed and Generator Differential Current. Plausible in that this signal would trip the diesel if not an emergency start.

Technical Reference(s): N2-OP-100A, System Description (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP 2101-264001C01, RBO-5, (As available)

Question Source: Bank # WTS

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 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	217000 K4.06	
	Importance Rating	3.5	

Knowledge of REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) design feature(s) and/or interlocks which provide for the following: Manual initiation

Proposed Question: RO Question # 8

The RCIC turbine is being manually started for level control after the RCIC MANUAL INITIATION pushbutton failed to operate. Conditions are as follows:

- RPV pressure is 850 psig and stable.
- RCIC system flow indicates 0 gpm.
- RCIC turbine speed indicates 4500 rpm.
- RCIC pump discharge pressure indicates 700 psig
- ICS*MOV126, PMP 1 DISCH TO REACTOR is open

Which one of the following is the minimum pump discharge pressure needed to establish injection flow into the RPV and the action needed to achieve that pressure per N2-OP-35, Reactor Core Isolation Cooling System?

A. 860 psig by manually raising turbine speed.

B. 860 psig by raising flow controller setpoint.

C. 960 psig by manually raising turbine speed.

D. 960 psig by raising flow controller setpoint.

Proposed Answer: C

Explanation (Optional):

A. Incorrect - because the pump discharge pressure is too low to open the injection check valve.

B. Incorrect - because the pump discharge pressure is too low to open the injection check valve.

C. Correct - per N2-OP-35, Step F.3.8 Slowly raise RCIC turbine speed using the RCIC FLOW CONTROLLER in M for Manual. F.3.9 NOTE, RCIC discharge pressure of

approximately 110 psig above Reactor pressure will be required to commence RPV injection.

D. Incorrect - because procedurally, the controller is in manual and changing the setpoint will not affect turbine speed/pump discharge pressure.

Technical Reference(s): N2-OP-35, F.3.9 NOTE, pg 25 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # WTSI 2856

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 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	205000 K5.02	
	Importance Rating	2.8	

Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE): Valve operation

Proposed Question: RO Question # 9

The plant is in Mode 4 due to a forced outage. Conditions are as follows:

- RHS B Loop is operating in Shutdown Cooling Mode
- The plant will not go to Mode 5 during the outage
- RHS B Heat Exchanger Service Water Outlet Temperature is 100°F and stable
- Cooldown Rate is 95°F/hr
- RHS*MOV8B, HEAT EXCHANGER 1B INLET BYPASS VLV THROTTLE is 50% open
- NO Reactor Recirculation Pumps are in operation
- RHR B Loop Flow is 5000 gpm

Which one of the following valve throttling manipulations is required to operate at rated system flow conditions while maintaining the current cooldown rate?

	RHS*MOV40B, SDC B RETURN throttled..	**RHS*MOV8B, HEAT EXCH. 1B INLET BYPASS VLV throttled..**
A.	CLOSED	CLOSED
B.	OPEN	CLOSED
C.	OPEN	OPEN
D.	CLOSED	OPEN

Proposed Answer: C

Explanation (Optional):

A. Incorrect - plausible; identifies misconception on action to reduce Cooldown Rate

B. Incorrect - plausible; identifies misconception on RHR Loop Flow acceptable value (7450 gpm) and action to reduce Cooldown Rate

C. Correct - With Loop Flow LOW, it is required to throttle RHS*MOV40B, SDC B RETURN THROTTLE in the OPEN direction. This will RAISE Cooldown rate. To LOWER

Cooldown rate, it is required to throttle RHS*MOV8B, HEAT EXCHANGER 1B INLET BYPASS VLV in the OPEN direction

D. Incorrect - plausible; identifies misconception on RHR Loop Flow acceptable value (7450 gpm)

Technical Reference(s): N2-OP-31 F.6.24 through 6.26 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # WTSI 1460

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 5

55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	209001 K5.05	
	Importance Rating	2.5	

Knowledge of the operational implications of the following concepts as they apply to LOW PRESSURE CORE SPRAY SYSTEM: System venting

Proposed Question: RO Question # 10

The plant is shutdown after a LOCA with the following conditions:

- RPV pressure is 410 psig and lowering slowly
- 2CSL*P1, Low Pressure Core Spray Pump has been shutdown
- 2CSL*P2, LPCS / RHR A WTR LEG PMP has tripped on motor electric fault
- Annunciator 601428, LPCS HIGH POINT VENT LEVEL LOW alarmed a short time after the water leg pump tripped
- The CRS has determined that LPCS is needed for core cooling

Which of the following is correct if 2CSL*P1 is restarted under these conditions?

A. 2CSL*P1 starts but does not inject into the RPV at this pressure.

B. 2CSL*P1 starts but trips due to overcurrent from excessive flow into the RPV.

C. The discharge piping could break in the primary containment resulting in a reduction in suppression pool level.

D. The discharge piping could break resulting in Reactor Building flooding and a reduction in suppression pool level.

Proposed Answer: D

Explanation (Optional):

A. Incorrect - LPCS injects at approximately 450 psig.

B. Incorrect – A restricting orifice is installed in the discharge piping to prevent pump runout when injecting into the RPV

C. Incorrect - A break in containment would cause suppression pool level to remain static.

D. Correct - OP-32, P&L 5.0 states To prevent water hammer, LPCS Pump should not be

manually started if annunciator 601428, LPCS HIGH POINT VENT LEVEL LOW is received. The pump is rated for a discharge flow rate of 6350 gpm at a discharge pressure of 290 psig.

Technical Reference(s):	N2-OP-32, P & L, pg 5 N2101209001C01, PID-32A	(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	
	Comprehension or Analysis	X

10 CFR Part 55 Content:	55.41	8
	55.43	

Components, capacity, and functions of emergency systems.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	300000 K6.13	
	Importance Rating	2.8	

Knowledge of the effect that a loss or malfunction of the following will have on the INSTRUMENT AIR SYSTEM: Filters

Proposed Question: RO Question # 11

The plant is operating at 100% power, when the following occurs:

- Annunciator 603306, CRD SCRAM VALVE PILOT AIR HDR PRESS HIGH/LOW, alarmed.
- 2IAS-TK3, RB Air Receiver pressure is 120 psig and stable.
- Auxiliary Operator reports the Scram Air Header pressure 63 psig and stable.
- NO control rods are drifting.

Which one of the following statements describes the action that is to be attempted to restore Scram Air Header pressure, per N2-SOP-19, Loss of Instrument Air?

A. Verify all IAS Compressors are loaded and bypass IAS Dryers

B. Swap Scram Air Header Supply Filters and Pressure Control Valves

C. Bypass Scram Air Header Supply Filters and Pressure Control Valves

D. Verify all IAS Compressors are loaded and isolate Service Air Header

Proposed Answer: B

Explanation (Optional):

A. Incorrect - This would be true for Dryer Valve malfunction

B. Correct - Per N2-SOP-19, it is required to swap Scram Air Header Supply Filters and Pressure Control Valves

C. Incorrect - This is not procedural. Scram air header is required to be filtered and regulated at 70 -75 psig

D. Incorrect - This would be true if IA Header Pressure was below 85 psig, due to a SA Header rupture

Technical Reference(s): N2-SOP-19, Att 3, step 1.4, pg 12 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: O2-OPS-001-279-2-00 (As available)

Question Source:	Bank #	NMP 2 #54267	
	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	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	1		
	K/A #	263000	K6.02	
	Importance Rating	2.5		

Knowledge of the effect that a loss or malfunction of the following will have on the D.C. ELECTRICAL DISTRIBUTION : Battery ventilation

Proposed Question: RO Question # 12

Which one of the following is the effect of the operating Battery Room Exhaust Fan, 2HVC*FN4B tripping on overcurrent?

A. Hydrogen will build up in the battery room and the battery must be removed from service.

B. The standby fan 2HVC*FN4A will automatically start and battery operation will NOT be affected.

C. Portable ventilation for the battery room must be setup to prevent Hydrogen buildup and the battery remains in operation.

D. Hydrogen will build up in the Battery Room until the standby fan 2HVC*FN4A is manually started, the battery remains in operation.

Proposed Answer: B

Explanation (Optional):

A. Incorrect - The concern is for battery operability caused by temperature changes and the buildup of H2 gas, however the standby fan will automatically start.

B. Correct - If FN4A trips the standby fan *FN4B will auto start on *FN4A low air flow if its control switch is in the "Normal After Stop" position. There will not be buildup of Hydrogen and there is no effect on battery operation.

C. Incorrect - The concern is for battery operability is caused by temperature changes and the buildup of H2 gas, however the standby fan will automatically start. Also portable ventilation is not required in this situation.

D. Incorrect - The concern is for battery operability caused by temperature changes and the buildup of H2 gas, however the standby fan will automatically start.

Technical Reference(s):	N2-OP-53E, System Description Page 2 N2-OP-74A, P&L 1.0, pg 3 N2-ARP-871300, 871317	(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	4
	55.43	

Secondary coolant and auxiliary systems that affect the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	261000 A1.02	
	Importance Rating	3.1	

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

Proposed Question: RO Question # 13

The plant is in Mode 1 with a reactor shutdown in progress. Conditions are as follows:

- Drywell de-inerting purge is in progress using GTS Train B IAW N2-OP-61A, Primary Containment Ventilation Purge and Nitrogen System
- 2GTS*PV5B, REACTOR BLDG INLET/OUTLET DIFF PRESS CONT VLV, is in MANUAL
- 2HVR-MOD17A and B, RX BLDG SPLY RECIRC DAMPERS are being controlled manually.
- Reactor Building DP is -0.9" water and stable
- Drywell pressure is 0.40 psig and slowly lowering

In this lineup, throttling closed on 2GTS*PV5B will cause Drywell pressure to ___(1)___ and Reactor Building Differential Pressure to become ___(2)___?

A. (1) lower faster
(2) less negative

B. (1) lower slower
(2) more negative

C. (1) lower slower
(2) less negative

D. (1) lower faster
(2) more negative

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible if the question stem asked about throttling closed 4B, (decay heat removal valve) instead of 5B.

B. Incorrect. Plausible if the question stem asked about 4B being throttled open instead of 5B being throttled closed.

C. Incorrect. Plausible if 5B were throttled open instead of closed.

D. Correct. If 5B were throttled in the closed direction, less air would be recirculated back to the suction of the GTS train. This would result in more flow from both the RB and the Drywell. With more flow coming from the drywell, drywell pressure would lower faster. With more flow coming from the RB, then the RB would get more negative.

Technical Reference(s):	N2-OP-61A, Sect 3.11.18 pg 43 One line diagram from GTS Lesson Plan.	(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	
	Comprehension or Analysis	X

10 CFR Part 55 Content:	55.41	5
	55.43	

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

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: RO Question # 14

Which one of the following identifies the response of Uninterruptible Power Supply 2VBA*UPS2A if the normal AC feed is lost?

A. UPS2A shifts to 2BYS*SWG002A.

B. The normal AC shifts to 2NJS-US4 via 2VBB-TRS1.

C. The Static switch automatically transfers to 2LAC*PNL100A.

D. Transfer switch 2VBA*TRS2A automatically shifts to 2VBA*UPS2C.

Proposed Answer: A

Explanation (Optional):

A. Correct - On loss of normal AC UPS2A will transfer to DC via BYS*SWG002A

B. Incorrect - UPS2A shifts to 2BYS*SWG002A. Plausible in that this would be correct if the question asked about UPS 1B and not UPS 2A.

C. Incorrect - UPS2A shifts to 2BYS*SWG002A. Plausible in that this would be correct if UPS 2A had an internal fault and not just a loss of normal AC input. On a UPS internal fault, the static switch would shift supply to the maintenance supply (2LAC*PNL100A) which would make this distracter correct

D. Incorrect - UPS2A shifts to 2BYS*SWG002A. Plausible in that the candidate would have to know that TRS2A is a manually operated transfer switch and not an automatic switch like TRS1 which supplies UPS 1A/B/G

Technical Reference(s): N2-OP-71D, Sect. 37.0, Pg 110
N2-ELU-01, Attachment 71D (Attach if not previously provided)

Proposed References to be provided to applicants during examination:			None
Learning Objective:			(As available)
Question Source:	Bank #	N2-262002-RBO08-Q01	
	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	7	
	55.43		

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	209002 A2.11	
	Importance Rating	3.3	

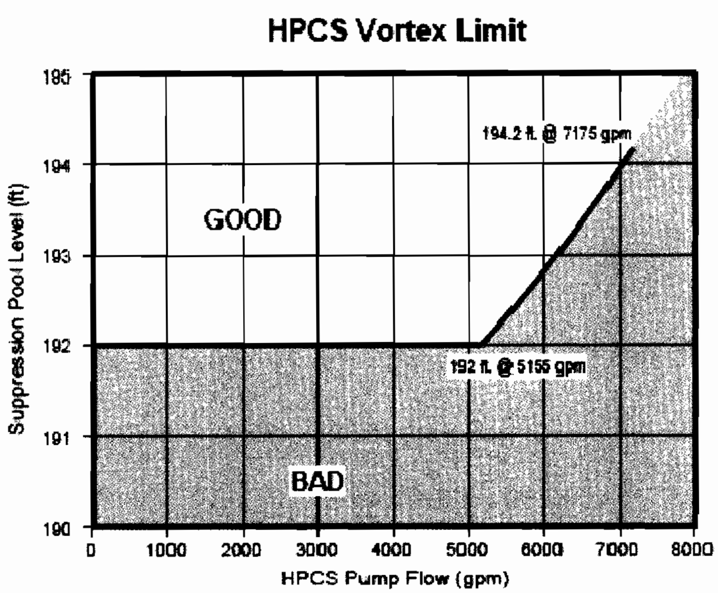
Ability to (a) predict the impacts of the following on the HIGH PRESSURE CORE SPRAY SYSTEM (HPCS); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low suppression pool level: BWR-5,6

Proposed Question: RO Question # 15

The plant is shutdown following a LOCA with the following conditions:

- HPCS is aligned and injecting into the core with suction from the suppression pool.
- RPV water level is 150 inches and slowly rising
- 2CSH*P1, HPCS P1 injection flow is 6500 gpm and stable
- Suppression Pool level is 192.5 feet and stable.
- The CRS has determined that 5000 gpm is needed from HPCS to maintain adequate core cooling.

Which one of the following describes (1) the impact of operating in this condition per NER-2M-039, NMP 2 EOP Bases, and (2) what action is necessary per N2-EOP-6, Attachment 29 to prevent it from happening?



A. (1) 2CSH*P1 may trip due to pump runout

(2) Secure 2CHS*P1 by placing the control switch in Pull To Lock

B. (1) 2CSH*P1 flow may noticeably degrade

(2) Secure 2CHS*P1 by placing the control switch in Pull To Lock

C. (1) 2CSH*P1 may trip due to pump runout

(2) Make 2CSH*MOV107, PMP 1 INJECTION VLV throttleable and reduce 2CSH*P1 flow to 5000 gpm

D. (1) 2CSH*P1 flow may noticeably degrade

(2) Make 2CSH*MOV107, PMP 1 INJECTION VLV throttleable and reduce 2CSH*P1 flow to 5000 gpm

Proposed Answer: D

Explanation (Optional):

A. Incorrect – Per the EOP Bases, Section 14, operating HPCS in the bad region of the vortex curve will cause HPCS capacity to noticeably degrade, not trip on pump runout. Also action to correct being in the bad region of the vortex curve is to make MOV107 throttleable and reduce flow to 5000 gpm (Attachment 29)

B. Incorrect - Action to correct being in the bad region of the vortex curve is to make MOV107 throttleable and reduce flow to 5000 gpm, not place the pump in PTL.

C. Incorrect - Per the EOP Bases, Section 14, operating HPCS in the bad region of the vortex curve will cause HPCS capacity to noticeably degrade, not trip on pump runout.

D. Correct – Per the EOP Bases, Section 14, operating HPCS in the bad region of the vortex curve will cause HPCS capacity to noticeably degrade and since the CRS only needs 5000 gpm from HPCS, Attachment 29 directs HPCS to be made throttleable and flow reduced.

Technical Reference(s): N2-EOP-6 Attachment 29, Section 3.4 and NER-2M-039 Section 14, Page 14-57 (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	239002 A2.05	
	Importance Rating	3.2	

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

Proposed Question: RO Question # 16

The plant has experienced a failure to scram with the following conditions:

- N2-EOP-C4, RPV Flooding has been entered
- 5 SRVs are open
- RPV pressure is stable at 225 psig
- The crew has commenced injection into the RPV using Condensate and Feed

Complete the following statement:

The reactor core ____(1)___ adequately cooled and the RO should __(2)___ the rate of injection until RPV pressure rises above 235 psig or until the RPV has been flooded to the main steam lines.

J	RPV Pressures
Number of Open SRVs	RPV Pressure (psig)
7	165
6	195
5	235
4	300
3	405
2	610

	(1)	(2)
A.	IS NOT	LOWER
B.	IS	LOWER

C.	IS NOT	RAISE
D.	IS	RAISE

Proposed Answer: C

Explanation (Optional):

A. Incorrect - The core IS NOT adequately cooled however the RO should RAISE injection flow to cause pressure to rise above the MSCP, not lower it.

B. Incorrect - The core IS NOT adequately cooled

C. Correct - The core IS NOT adequately cooled and the RO should RAISE injection flow to cause pressure to rise above the MSCP.

D. Incorrect - The core IS NOT adequately cooled.

Technical Reference(s): N2-EOP-C4 and NER-2M-039 Section 11, Page 11-20 and definition of adequate core cooling (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	215004 A3.02	
	Importance Rating	3.4	

Ability to monitor automatic operations of the SOURCE RANGE MONITOR (SRM) SYSTEM including: Annunciator and alarm signals

Proposed Question: RO Question # 17

A reactor startup is in progress. While withdrawing rods to raise reactor power, the following annunciator alarms:

- 603216, SRM DETECTOR POSITION ABNORMAL

Which one of the following is correct with regard to this annunciator?

At least one SRM is indicating......

A. <3 cps with its detector not full in. A rod withdrawal block will be generated if IRMs are on range 2 or below.

B. <3 cps with its detector not full in. A rod withdrawal block will be generated if IRMs are on range 7 or below.

C. <100 cps with its detector not full in. A rod withdrawal block will be generated if IRMs are on range 2 or below.

D. <100 cps with its detector not full in. A rod withdrawal block will be generated if IRMs are on range 7 or below.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible in that <3 cps is the SRM DOWNSCALE ALARM which will generate a rod block

B. Incorrect. Plausible in that <3 cps is the SRM DOWNSCALE ALARM which will generate a rod block and the SRM UPSCALE alarm will generate a rod block if IRMs are on range 7 or below

C. Correct. Anytime an SRM reads <100 cps and its detector is not full in, 603216 will annunciate. A rod withdrawal block will be initiating if IRMS are on rage 2 or below, (i.e. bypassed if IRMS are on range 3 or above)

D. Incorrect. Plausible in that the SRM UPSCALE alarm will give you a rod block if on range 7 or below.

Technical Reference(s): N2-ARP-603216
SRM Lesson Plan, Obj. 5 (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 6

55.43

Design, components, and function of reactivity control mechanisms and instrumentations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	218000 A3.01	
	Importance Rating	4.2	

Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: ADS valve operation

Proposed Question: RO Question # 18

Following an AUTOMATIC initiation of the Automatic Depressurization System (ADS), the following conditions exist:

- ALL Low Pressure ECCS Pumps have been TRIPPED due to Suction Strainer clogging.
- 2CSH*P1, HPCS PMP 1 is running and injecting into the core.
- RPV Water Level is 30 inches and RISING.

What is the status of the ADS Safety Relief Valves (SRVs)?

ADS SRVs...

A. remain OPEN due to a logic seal-in

B. have SHUT due to recovering RPV Water Level

C. have SHUT due to loss of ECCS Pump permissives

D. remain OPEN because an ECCS Pump is providing a permissive signal

Proposed Answer: A

Explanation (Optional):

A. Correct - Initially, LP ECCS Pumps were RUNNING. Manual Initiation switches energize K6A Initiation Relay AND K8A Seal In Relay. When K8A is energized, it seals itself in by closing a contact above the Seal In Reset pushbutton in the diagram. ADS Valves REMAIN OPEN, even if LP ECCS Pump permissives are subsequently LOST.

B. Incorrect - RPV Water Level has restored above the actuation setpoint (RPV Water Level 1), 17.8 inches and valves would close without seal in function on RPV Water Level, Manual Initiation, or LP ECCS Pump Discharge Pressure permissive

C. Incorrect - The seal in circuit IS still made up after the pumps trip, so the valves remain open

D. Incorrect - High Pressure ECCS (HPCS) Pump does NOT provide a Discharge Pressure permissive signal to ADS

Technical Reference(s): ADS Logic Diagram (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # NMP 2 #54266

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 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

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: RO Question # 19

The plant was operating at 100% power when a plant transient occurred. Conditions are as follows:

- Indications on the Average Power Range Monitor Chassis for APRMs 1 through 4 have "OPRM" displayed in inverse video.

Which one of the following conditions is indicated by these displays?

Reactor power is ≥30% __(1)__ core flow is ≤60%.

OPRM trips and alarm setpoints are __(2)__.

A. (1) OR
(2) ENABLED

B. (1) AND
(2) ENABLED

C. (1) OR
(2) NOT ENABLED

D. (1) AND
(2) NOT ENABLED

Proposed Answer: B

Explanation (Optional):

A. Incorrect - With OPRM displayed in inverse video, power must be ≥30% AND core flow must be ≤60%.

B. Correct - With OPRM displayed in inverse video, power must be ≥30% AND core flow must be ≤60%. Also, when OPRM is displayed, this indicates that the OPRM trips and setpoints are ENABLED

C. Incorrect - With OPRM displayed in inverse video, power must be ≥30% AND core flow must be ≤60%. Also, having OPRM is displayed, this indicates that the OPRM trips and setpoints are ENABLED

D. Incorrect - Having OPRM is displayed, this indicates that the OPRM trips and setpoints are ENABLED

Technical Reference(s): N2-OP-92, pg 4 (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 6

55.43

Design, components, and function of reactivity control mechanisms and instrumentation.

Comments:

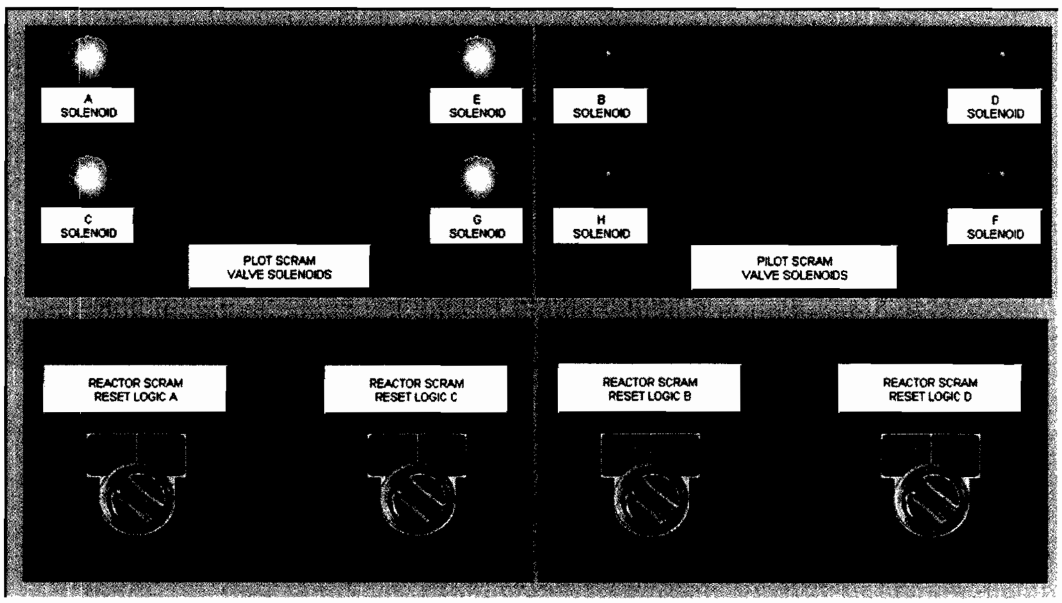
Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	212000 A4.08	
	Importance Rating	3.4	

Ability to manually operate and/or monitor in the control room: Individual system relay status: Plant-Specific (RPS)

Proposed Question: RO Question # 20

A reactor startup is in progress with power at 4%. Conditions are as follows:

- IRM B failed upscale causing a half scram on the B side
- IRM B has been bypassed
- The RO is in the process of resetting the half scram on the B side



Which one of the following lists the minimum number of switches that must be placed in RESET in order to reenergize the RPS B PILOT SCRAM VALVE SOLENOID white lights?

A. Only REACTOR SCRAM RESET LOGIC B

B. Only REACTOR SCRAM RESET LOGIC D

C. Both REACTOR SCRAM RESET LOGIC A and B

D. Both REACTOR SCRAM RESET LOGIC B and D

Proposed Answer: A

Explanation (Optional):

A. Correct. IRM B trips only the B1 logic. Since Scram Reset Logic Switch B resets the B1 Logic, then the RO is only required to place the B switch in reset in order to reset the RPS B logic and energize the RPS B white solenoid lights.

B. Incorrect. Scram Logic Reset Switch D is only associated with B2 logic which is not deenergized. IRM D or H would have had to trip in order to cause B2 logic to deenergize.

C. Incorrect. Scram Logic Reset Switch A is only associated with the A1 logic which is currently energized.

D. Incorrect. Scram Logic Reset Switch D is only associated with B2 logic which is not deenergized. IRM D or H would have to trip in order to cause B2 logic to deenergize.

Technical Reference(s): RPS Logic Prints (807E166TY series) (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 6

55.43

Design, components, and function of reactivity control mechanisms and instrumentation.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	259002 2.4.4	
	Importance Rating	4.5	

Emergency Procedures / Plan: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (Reactor Water Level Control)

Proposed Question: RO Question # 21

The plant is operating at 100% when the following occurs:

- Loop A Feed Flow Transmitter 2FWS-FT1A fails downscale

With NO operator actions, which one of the following will result first, and what actions are required?

A. RPV Water Level will LOWER until reaching Level 3, and actions will be required per N2-EOP-RPV, RPV Control

B. RPV Water Level will RISE until reaching Level 8, and actions will be required per N2-SOP-101C, Reactor Scram

C. RPV Water Level will RISE and stabilize below Level 8, and actions will be required per N2-SOP-06, Feedwater Failures

D. BOTH Reactor Recirculation Pumps will DOWNSHIFT, and actions will be required per N2-SOP-08, Unplanned Power Change

Proposed Answer: B

Explanation (Optional):

A. Incorrect - This would be true for the selected RPV Water Level Channel failed HIGH

B. Correct - "full power" implies Three Element Auto control. When ONE Feedwater Flow Input FAILS LOW, FLCS will increase Feedwater Flow until RPV Water Level 8 is reached. L8 causes a Main Turbine and RFP Trips, which causes a scram requiring N2-SOP-101C entry

C. Incorrect - This would be true for a single Steam Line Flow Input failed HIGH

D. Incorrect - This would be true if BOTH Feedwater Flow Inputs failed LOW. <22.4% for 15 seconds downshifts both RR Pumps

Technical Reference(s): FWLC Lesson Plan, Objective 11 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # WTSI 1527

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 5

55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	262002 2.4.49	
	Importance Rating	4.6	

Emergency Procedures / Plan: Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (UPS)

Proposed Question: RO Question # 22

2VBB-UPS1B is in service with the TRANSFER CONTROL SWITCH in MANUAL RESTART when a temporary overload occurs and then clears.

Which one of the following describes (1) how 2VBB-UPS1B loads are powered AFTER this event AND (2) what actions are required to restore a normal lineup per N2-OP-71D?

A. (1) 2NJS-US6
(2) Manually transfer to the normal supply at panel 2VBB-PNL301.

B. (1) 2NJS-US4
(2) Manually transfer to the normal supply at the UPS, 2VBB-UPS1B.

C. (1) 2NJS-US6
(2) Place the TRANSFER CONTROL SWITCH at 2VBB-UPS1B to AUTO RESTART.

D. (1) 2NJS-US4
(2) Place the TRANSFER CONTROL SWITCH at 2VBB-PNL301 to AUTO RESTART.

Proposed Answer: C

Explanation (Optional):

A. Incorrect - The transfer switch is located at UPS 2VBB-UPS1B.

B. Incorrect - The normal supply is 2NJS-US6, not 2VBB-PNL301.

C. Correct - When the transfer control switch in manual restart, once the UPS transfers to maintenance it will remain there until manually transferred back to the normal AC. The temporary overload condition would cause the UPS to transfer to maintenance and it would remain there after the condition cleared because the transfer control switch is in manual restart. The UPS must be manually transferred back to its normal supply 2NJSUS6 at the UPS.

D. Incorrect - The UPS normal supply is 2NJS-US6 and the UPS must be manually transferred back to its normal supply at the UPS.

Technical Reference(s): UPS Lesson Plan, Obj. 4 and 5
N2-OP-71D, Sect. H.29.14 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # WTSI 4167
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 7
55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

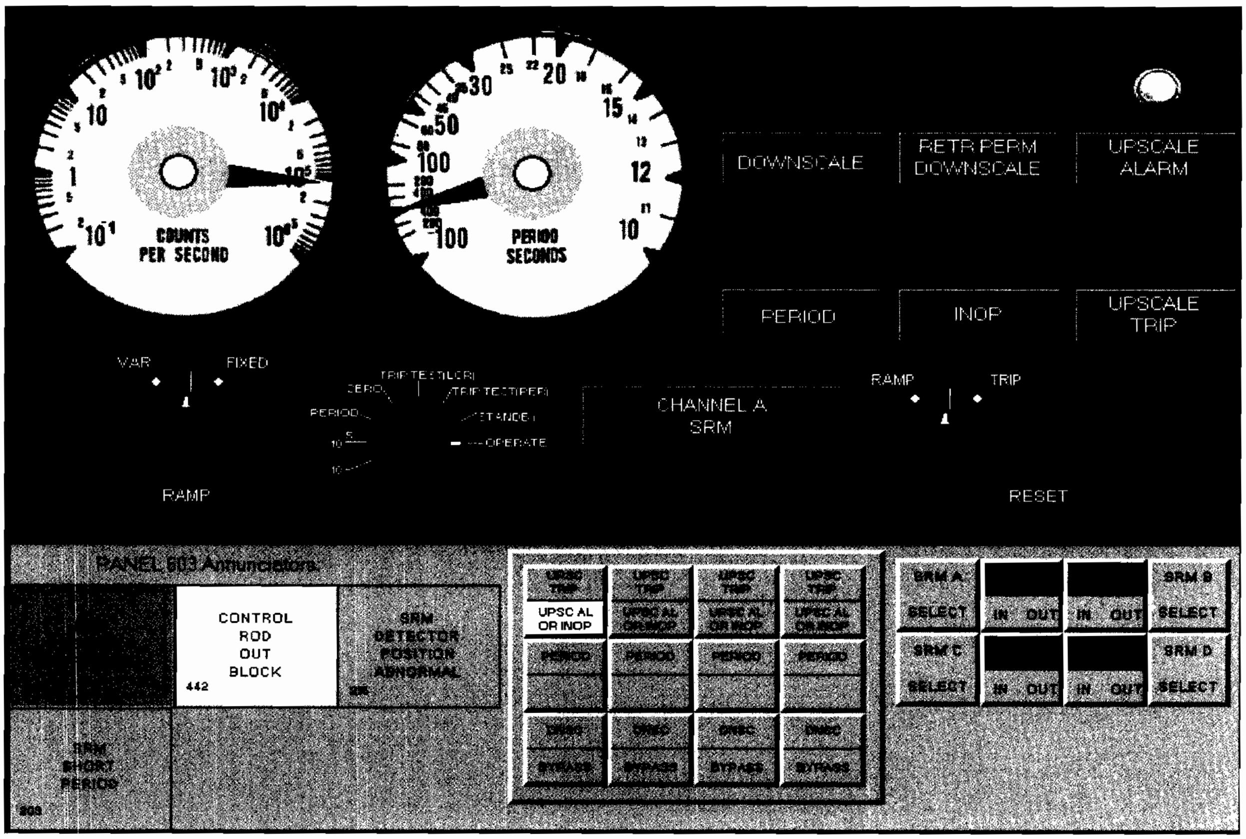
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	215004 A2.04	
	Importance Rating	3.5	

Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Up scale and downscale trips

Proposed Question: RO Question # 23

The plant is starting up following an outage when the following indications are observed for SRM A after withdrawing a control rod:



Which one of the following actions is required to continue the startup?

A. Bypass SRM A Channel to clear the INOP condition

B. Retract SRM A Detector to clear the UPSC condition

C. Wait until ALL IRMs are on Range 8, THEN retract SRM Detector to clear the UPSC condition

D. Wait until ALL IRMs are on Range 3, THEN verify the Control Rod Out Block automatically clears

Proposed Answer: B

Explanation (Optional):

A. Incorrect - This would be true with the white INOP Light on the drawer LIT

B. Correct - Upscale Alarm condition is indicated by light status. With a startup in progress, SRMs are required to be maintained on scale by retracting detectors

C. Incorrect - This does not maintain SRM indication on scale, as required

D. Incorrect - SRM <100 cps is BYPASSED when ALL IRMs are on Range 3

Technical Reference(s): N2-ARP-603200, 603203 (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	215003 A1.02	
	Importance Rating	3.7	

Ability to predict and/or monitor changes in parameters associated with operating the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM controls including: Reactor power indication response to rod position changes

Proposed Question: RO Question # 24

During a reactor startup the following conditions exist:

- IRM channel "E" is on Range 1 and is reading 10 on the 0-40 scale.
- Control rod withdrawal has the reactor on a stable 100 sec period.

3 minutes later, which one of the following will be the IRM "E" indication if the RO correctly moves the IRM range switches?

	Power (CPS)	**IRM Scale**	**IRM Range**
A.	10	40	Range 5
B.	33	125	Range 4
C.	30	40	Range 3
D.	60	125	Range 2

Proposed Answer: D

Explanation (Optional):

A. Incorrect - A reactor period of 100 seconds will result in power rising by 6.045 which is equivalent to ~60 on IRM range 2.

B. Incorrect - A reactor period of 100 seconds will result in power rising by 6.045 which is equivalent to ~60 on IRM range 2.

C. Incorrect - A reactor period of 100 seconds will result in power rising by 6.045 which is equivalent to ~60 on IRM range 2.

D. Correct - A reactor period of 100 seconds will result in power rising by 6.045 which is equivalent to ~60 on IRM range 2.($P=P_o^{T/\tau}$ 10 x $e^{180/100}$ = 6.045) or Reactor Period (1.44 x Doubling Time)

Technical Reference(s):	N2-OP-101A, Sect 2.20, pg 17 IRM Lesson Plan, Obj. 5	(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	
	Comprehension or Analysis	X

10 CFR Part 55 Content:	55.41	6
	55.43	

Design, components, and function of reactivity control mechanisms and instrumentation

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	239002 A4.05	
	Importance Rating	4.3	

Ability to manually operate and/or monitor in the control room: Reactor pressure (SRVs)

Proposed Question: RO Question # 25

Given the following:

- The main turbine has tripped and reactor pressure has increased above the scram setpoint.
- Approximately one third of the control rods remain fully withdrawn.
- MSIV's remain open and several SRV's are cycling.

N2-EOP-C5, Failure to Scram directs that SRVs be manually opened until RPV pressure drops to _______ psig.

Which ONE of the following identifies (1) this pressure and (2) the basis for performing this action per NER-2M-039, NMP EOP Bases?

A. (1) 800 psig
(2) Prevent automatic closure of the MSIV's

B. (1) 800 psig
(2) Maintain Turbine Bypass Valves open

C. (1) 970 psig
(2) Prevent automatic closure of the MSIV's

D. (1) 970 psig
(2) Maintain Turbine Bypass Valves open

Proposed Answer: D

Explanation (Optional):

A. Incorrect - wrong pressure per EOP

B. Incorrect - wrong pressure per EOP

C. Incorrect - MSIV closure is at lower value

D. Correct - 970 psig is the pressure at which bypass valves should be full open reducing below this pressure will cause them to close

Technical Reference(s): N2-EOP-C5
EOP Bases page 12-51 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # 2008 Audit Exam
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 10
55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	211000 2.2.42	
	Importance Rating	3.9	

Equipment Control: Ability to recognize system parameters that are entry-level conditions for Technical Specifications. (Standby Liquid Control System)

Proposed Question: RO Question # 26

The plant is operating at 100% power when the following occur:

- Annunciator 601711, SLCS TANK 1 TEMPERATURE HIGH/LOW, alarms.
- The field operator reports that local tank temperature is 69 degrees and that the breakers for both heaters are tripped.

Assuming that temperature continues to drop while troubleshooting the tripped breakers:

(1) Which one of the following actions is required AND
(2) Per the Unit 2 Technical specification bases, what is the reason for this action

A. (1) Declare ONE SLC subsystem inoperable
(2) Boron precipitation in the SLC tank

B. (1) Declare BOTH SLC subsystems inoperable
(2) Boron precipitation in the SLC tank

C. (1) Declare ONE SLC subsystem inoperable
(2) The SLC pump may not meet its flowrate surveillance requirement

D. (1) Declare BOTH SLC subsystems inoperable
(2) The SLC pumps may not meet their flowrate surveillance requirements

Proposed Answer: B

Explanation (Optional):

A. Incorrect - Both SLC subsystems are inoperable; they both take suction from the same SLC storage tank.

B. Correct - Technical Specifications 3.1.7.2 requires SLC Tank temperature be maintained at or above 70°F. With the temperature below this limit, both SLC subsystems are inoperable; they both take suction from the same SLC storage tank. SLC Tank temperature is maintained at or above 70°F to insure the Pentaborate

solution does not fall below its precipitation temperature.

C. Incorrect - Both SLC subsystems are inoperable; they both take suction from the same SLC storage tank.
SLC Tank temperature is maintained at or above 70°F to insure the Pentaborate solution does not fall below its precipitation temperature

D. Incorrect - SLC Tank temperature is maintained at or above 70°F to insure the Pentaborate solution does not fall below its precipitation temperature.

Technical Reference(s): TS section 3.1.7 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
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 6
55.43

Design, components, and function of reactivity control mechanisms and instrumentation.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	201003 K1.02	
	Importance Rating	2.9	

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

Proposed Question: RO Question # 27

The plant is operating at 100% power when the scram inlet valve for a control rod at position 24 opens.

Which one of the following identifies (1) the response of reactor power and the (2) scram discharge volume (SDV) level to this event?

A. (1) Rises
(2) Rises

B. (1) Rises
(2) Stays the same

C. (1) Lowers
(2) Rises

D. (1) Lowers
(2) Stays the same

Proposed Answer: D

Explanation (Optional):

A. Incorrect - Reactor power lowers, not rises, because the scram outlet valve did not open, SDV level remains the same

B. Incorrect - Reactor power lowers, not rises

C. Incorrect - SDV level remains the same, it does not rise.

D. Correct - opening of the scram inlet valve will cause the control rod to partially drift in, resulting in a drop in reactor power. Although the rod will be prohibited from fully inserting due to potential mechanism damage, the rod will still partially insert causing reactor power to lower. Because the scram outlet valve did not open, SDV level remains the same

Technical Reference(s):	N2101201001C01, Obj. 11		(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source:	Bank #	ID: N2-201001-RBO-11-Q07	
	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	2
	55.43	

General Design features of the core, including core structure, fuel elements, control rods, core instrumentation, and coolant flow.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	215002 K2.03	
	Importance Rating	2.8	

Knowledge of electrical power supplies to the following: APRM channels: BWR-3,4,5 (RBM)

Proposed Question: RO Question # 28

With the plant operating at full power, a loss of power from 2VBB-UPS3A occurs.

Which one of the following describes the impact of this power loss on the Rod Block Monitor and Average Power Range Monitors?

A. APRM Channels 1 and 2 are de-energized and produce an RPS A half scram. RBM Channel A loses power and causes a rod block.

B. APRM Channels 3 and 4 are de-energized and produce an RPS B half scram. RBM Channel B loses power and causes a rod block.

C. APRM Channels 1 and 2 lose a power source, but remain energized. Loss of power to a 2/4 Logic Module produces an RPS A half scram. RBM Channel A loses a power source but remains energized.

D. APRM Channels 3 and 4 lose a power source, but remain energized. Loss of power to a 2/4 Logic Module produces an RPS B half scram. RBM Channel B loses a power source but remains energized.

Proposed Answer: C

Explanation (Optional):

A. Incorrect - APRMs and RBMs are powered from Quadruple Low Voltage Power Supplies with redundant supply sources. Loss of 2VBB-UPS3A removes one of two inputs of power to QLVPS

B. Incorrect - APRMs and RBMs are powered from Quadruple Low Voltage Power Supplies with redundant supply sources. Loss of 2VBB-UPS3A removes one of two inputs of power to QLVPS

C. Correct - APRMs and RBMs are powered from Quadruple Low Voltage Power Supplies with redundant supply sources. Loss of 2VBB-UPS3A removes one of two inputs of power to QLVPS, and a loss of power to the 2/4 Logic Module which produces an RPS

A Half Scram

D. Incorrect - Would be correct for a Loss of 2VBB-UPS3B

Technical Reference(s): UPS Lesson Plan, Obj. 8 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP #2101-215003C01 (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 6
55.43

Design, components, and function of reactivity control mechanisms and instrumentation.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	230000 K3.01	
	Importance Rating	3.7	

Knowledge of the effect that a loss or malfunction of the RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE will have on following: Suppression chamber pressure

Proposed Question: RO Question # 29

The plant is shutdown following a LOCA. Conditions are as follows:

- Suppression Pool Water Level is 233 feet
- Suppression chamber pressure is 5 psig and stable

Which one of the following correctly completes the following statement?

If RHS A were placed in suppression chamber spray, __________.

A. suppression chamber pressure would not be affected because the suppression chamber spray ring is submerged.

B. suppression chamber and drywell pressure would lower at the same rate because the pressure suppression function of the primary containment has been lost.

C. the primary containment could potentially reach its design negative pressure capability of -4.7 psig because the drywell to suppression chamber vacuum breaker openings are submerged.

D. the drywell floor could potentially reach its design upward floor differential pressure of 10 psid because the drywell to suppression chamber vacuum breaker openings are submerged.

Proposed Answer: A

Explanation (Optional):

A. Correct. The suppression chamber spray rings are at elevation 231 feet. Per NER-2M-039 (page 5-17), with the spray nozzles submerged, there will be no spraying action and suppression chamber pressure would be unaffected.

B. Incorrect. Although the pressure suppression function could be considered lost with the openings of the vacuum breakers submerged, it will not cause drywell and suppression chamber pressure to lower at the same rate. Additionally the suppression chamber

spray rings are submerged, so no spraying action will occur.

C. Incorrect. Plausible if the question asked about drywell sprays and conditions were given such that you were outside the drywell spray initiation limit.

D. Incorrect. Plausible if the question asked what would happen if you initiated drywell sprays as this is the reason you do not spray the drywell if the vacuum breaker openings are submerged.

Technical Reference(s): NER-2M-039 (page 5-17) (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 9

55.43

Shielding, isolation, and containment design features, including access limitations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	201001 K4.10	
	Importance Rating	3.1	

Knowledge of CONTROL ROD DRIVE HYDRAULIC SYSTEM design feature(s) and/or interlocks which provide for the following: Control of rod movement (HCU directional control valves)

Proposed Question: RO Question # 30

A reactor shutdown is in progress. An operator is attempting to move rod 02-35 from position 26 to position 24 using single notch movement when the following occurs:

- Rod 02-35 triple notches to position 20
- Troubleshooting has determined the directional control valves, (DCV) on HCU 02-35 malfunctioned.

Which ONE of the following directional control valve failures could have caused rod 02-35 to triple notch?

Note:

- SOV-120 is Withdraw, Exhaust, and Settle DCV
- SOV-121 is Insert Exhaust DCV
- SOV-122 is Withdraw Supply DCV
- SOV-123 is Insert Supply DCV

A. SOV-121 and SOV-123 shut earlier than required during the DCV insert sequence.

B. SOV-120 and SOV-122 shut earlier than required during the DCV insert sequence.

C. SOV-121 and SOV-123 stayed open longer than required during the DCV insert sequence.

D. SOV-120 and SOV-122 stayed open longer than required during the DCV insert sequence.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. 121 and 123 shutting earlier than required would have caused the rod to

insert a shorter distance than one notch.

B. Incorrect. 120 and 122 are the withdraw DCV and would not operate as a pair during the insert DCV sequence

C. Correct. With 121 and 123 staying open longer, drive flow is applied to the insert side of the CRDM causing the rod to continue to move in.

D. Incorrect. 120 and 122 are the withdraw DCV and would not operate as a pair during the insert DCV sequence.

Technical Reference(s): N2-OP-30, System Description page 10. (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 6

55.43

Design, components, and function of reactivity control mechanisms and instrumentation.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	2		
	Group #	2		
	K/A #	290002	K5.01	
	Importance Rating	3.5		

Knowledge of the operational implications of the following concepts as they apply to REACTOR VESSEL INTERNALS: Thermal limits

Proposed Question: RO Question # 31

The reactor was MANUALLY scrammed from rated power due to a trip of BOTH Recirc pumps. Conditions are as follows:

- Reactor pressure is 800 psig and lowering
- Reactor water level is 150 inches and stable
- Neither Recirc pump is running

Which one of the following is a concern per N2-SOP-29?

A. Vessel stratification causing excessive cooldown of the bottom head

B. The loss of control rod drive cooling water flow may damage the control rod drives

C. A Group 1 isolation will occur if RPV pressure lowers less than 766 psig

D. Excessive cooldown of the Recirc loops resulting in exceeding the Dome to Recirc loop differential temperature limitation

Proposed Answer: A

Explanation (Optional):

A. Correct: Per N2-SOP-29, Attachment 1, Recovering from Sudden Reduction in Recirc Flow, page 4 of 6, the concern is excessive cooldown of the bottom head. One of the corrective actions provided is to reset the scram which will reduce the cooldown of the bottom head

B. Incorrect: Since RPV level is <159 inches, the scram cannot have been reset so there is a large amount of CRD water passing up through the CRDMs so cooling is not a problem.

C. Incorrect – A Group 1 isolation will not occur because the mode switch is NOT in RUN.

D. Incorrect: There is no limit for Dome to Recirc loop differential temperature. The limit is Dome to Bottom Head Differential temperature, (145F)

Technical Reference(s): N2-SOP-29, Att 1, pgs 3 & 4 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP #2101-SOP29C01, Sudden Reduction in Core Flow Obj.-3, Operational Actions and Sequence (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 5

55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	219000 K6.08	
	Importance Rating	2.7	

Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE: ECCS room cooling

Proposed Question: RO Question # 32

The plant is shutdown following a stuck open SRV. Conditions are as follows:

- RHS Pump "A" is in service in for suppression pool cooling
- RHS Pump "B" is aligned for shutdown cooling
- Both RHS Pump "A" Room Unit Coolers have tripped
- Annunciator 601456, RHR PUMP ROOM A/B TEMPERATURE HIGH is in alarm
- Annunciator 601457, RHR PUMP ROOM A/B TEMPERATURE HI-HI alarms

Which one of the following automatic actions will occur and how will the suppression pool cooling lineup and/or shutdown cooling lineup be affected?

A. This is an alarm condition only and no pump trips or valve lineup changes will occur.

B. A Group 5 isolation will occur but the suppression pool cooling lineup will NOT be affected.

C. A Group 5 isolation will occur and RHS Pump "A" will trip but no valves will change position.

D. Suppression Pool Cooling Valve 2RHS*FV38A will close and RHS Pump "A" will continue to run on minimum flow.

Proposed Answer: B

Explanation (Optional):

A. Incorrect - Annunciator 601457, RHR PUMP ROOM A/B TEMPERATURE HI-HI is synonymous with a Group 5 isolation and the RHS B SDC lineup will be affected.

B. Correct - Annunciator 601457, RHR PUMP ROOM A/B TEMPERATURE HI-HI is synonymous with a Group 5 isolation, however this only affects the shutdown cooling lineup and will NOT affect the suppression pool cooling lineup.

C. Incorrect - No changes in the lineup or pump trips will occur.

D. Incorrect - No changes in the lineup or pump trips will occur.

Technical Reference(s): N2-ARP-601400, 601457
N2-OP-52, Page 70 (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 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	233000 A1.06	
	Importance Rating	2.5	

Ability to predict and/or monitor changes in parameters associated with operating the FUEL POOL COOLING AND CLEAN-UP controls including: System flow

Proposed Question: RO Question # 33

Regarding the Spent Fuel Pool Cooling (SFC) system, complete the following statements:

During a LOCA the OPERATING SFC Pump will ____(1)____.

During a simultaneous LOOP/LOCA the OPERATING SFC Pump will ____(2)____.

A. (1) continue running
(2) trip but automatically starts after 60 seconds

B. (1) continue running
(2) trip but can be manually started after 60 seconds

C. (1) trip but can be manually started after 60 seconds
(2) trip but automatically starts after 60 seconds

D. (1) trip but can be manually started after 60 seconds
(2) trip but can be manually started after 60 seconds

Proposed Answer: B

Explanation (Optional):

A. Incorrect. If a simultaneous LOOP/LOCA occurs the running Pumps will trip. A Pump may be manually restarted after 60 seconds using N2-SOP-03.

B. Correct: On a LOCA, the running Pump will continue to run but a Pump cannot be started or restarted during the first 60 seconds after receipt of the LOCA signal. If a LOOP/LOCA occurs the running Pumps will trip. A Pump may be manually restarted after 60 seconds using N2-SOP-03.

C. Incorrect: On a LOCA, the running Pump will continue to run and during a LOOP the running Pumps will trip. A Pump may be manually restarted after 60 seconds.

D. Incorrect: On a LOCA, the running Pump will continue to run.

Technical Reference(s): N2-OP-38, pg 5 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP #2101-SOP03C01, RBO-3
LP #2101-233000C01, RBO-2 (As available)

Question Source: Bank #
Modified Bank # WTSI 11861 (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 7
55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	286000 A2.08	
	Importance Rating	3.2	

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

Proposed Question: RO Question # 34

One zone of Relay Room Underfloor Area fire detection is inoperable and has been placed in Alarm Only at 2CEC*PNL849. This area is protected by cross zone detection.

Which one of the following identifies the impact of this failure if an actual fire occurs in the room?

The remaining zone will _______

A. ONLY actuate control room alarms. Fire suppression must be manually actuated.

B. actuate local AND control room alarms. Fire suppression must be manually actuated.

C. ONLY actuate control room alarms. Fire suppression will be automatically actuated.

D. actuate local AND control room alarms. Fire suppression will be automatically actuated.

Proposed Answer: B

Explanation (Optional):

A. Incorrect - alarms will still occur locally from the remaining operating zone.

B. Correct - per N2-OP-47, Section B, page 8 (system description), If a fire occurs in a zone and the fire is determined to be an actual fire but the zone is in Alarm Only, the suppressant may be discharged manually form the control room or locally

C. incorrect - alarms occur locally and in the control room, suppression requires both

D. Incorrect - requires one detector in both zones for auto actuation

Technical Reference(s): N2-OP-47, Sect B, pg 8 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # WTSI 1023

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 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	216000 A3.01	
	Importance Rating	3.4	

Ability to monitor automatic operations of the NUCLEAR BOILER Instrumentation including: Relationship between meter/recorder readings and actual parameter values: Plant-Specific

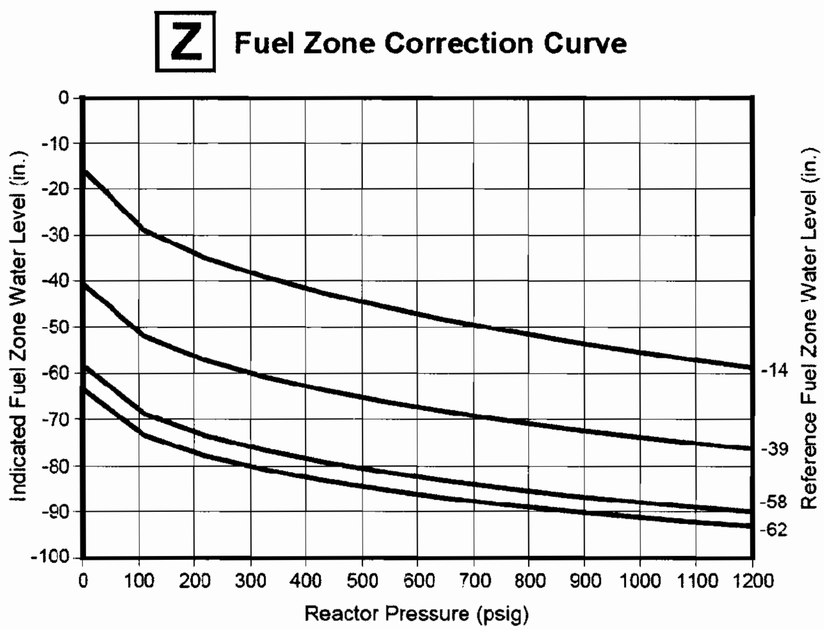
Proposed Question: RO Question # 35

The plant is shutdown following a LOCA. Conditions are as follows:

- HPCS system is not injecting
- Indicated RPV level is -50 inches
- RPV pressure is 600 psig

Which one of the following correctly completes the following statement?

Actual RPV water level is ___(1)___ the Top of Active Fuel and the core is being cooled using ___(2)___.



A. (1) ABOVE
(2) boiling heat transfer only

B. (1) ABOVE
(2) boiling heat transfer AND steam flow

C. (1) BELOW
(2) steam flow only

D. (1) BELOW
(2) boiling heat transfer AND steam flow

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Actual RPV water level is below the TAF but above the MSWL. Plausible in that if the candidate does not interpret the graph right, they may determine water level is above the TAF and that Submergence is the correct mechanism for ACC.

B. Incorrect. Plausible if the candidate does not interpret the graph right, they may determine actual water level is above the TAF and if they do not know the mechanism for ACC when above the TAF, they may think steam cooling is viable.

C. Incorrect. Actual RPV water level is below the TAF but only the uncovered portion of the core is cooled by steam cooling. The submerged portion of the core is cooled by submergence. Plausible if the candidate does not understand the steam cooling ACC mechanism.

D. Correct. When plotting on the graph, actual water level lies between the TAF and the MSCWL. When operating in this region, the method of ACC is submergence for the covered portion of the core and steam cooling for the uncovered portion of the core.

Technical Reference(s): N2-EOP-RPV Figure Z and Bases
NER-2M-039, Page 14-31 (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	
	Comprehension or Analysis	X

10 CFR Part 55 Content:	55.41	5, 14
	55.43	

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Principles of heat transfer, thermodynamics, and fluid mechanics.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	204000 A4.08	
	Importance Rating	3.4	

Ability to manually operate and/or monitor in the control room: Reactor water level

Proposed Question: RO Question # 36

A plant startup is in progress. Conditions are as follows:

- RPV pressure is 500 psig
- Annunciator 603139, REACTOR WATER LEVEL HIGH/LOW alarms
- RPV water level is 178" and slowly lowering

Per ARP 603139, what actions are required to restore reactor water level to the normal band?

A. Reduce WCS reject flow by closing WCS-FV135.

B. Start a second RDS pump and maximize CRD flow.

C. Enter N2-SOP-06, Feedwater Failures. Start a feed pump and take manual control of 2FWS-LV10B to restore level.

D. Enter N2-SOP-06, Feedwater Failures. Start a feed pump and take manual control of 2FWS-LV55B to restore level.

Proposed Answer: A

Explanation (Optional):

A. Correct - IAW ARP 603139, Do not enter SOP-06 when below 900 psig. WCS reject flow must be reduced by closing WCS*FV135 to stop rejecting to the condenser or radwaste.

B. Incorrect - The ARP does not direct starting a second RDS pump, it directs raising CRD injection flow to approximately 63 gpm. This can be done with one RDS pump

C. Incorrect - IAW N2-ARP-01, Do not enter SOP-06 below 900 psig. Also, SOP-6 does not allow you to start an additional feed pump and LV10 would not be in service at this pressure.

D. Incorrect - IAW N2-ARP-01, Do not enter SOP-06 below 900 psig. Additionally, SOP-6

does not allow you to start an additional feed pump

Technical Reference(s): N2-ARP-603100, 603139 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP 2101-204000C01, RBO-8 (As available)

Question Source:	Bank #	WTSI 11683	
	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	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	256000 2.1.7	
	Importance Rating	4.4	

Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (Reactor Condensate)

Proposed Question: RO Question # 37

The plant is operating at 85% power, with the following:

- 7 Condensate Demins are in service and 2 are in standby
- Fourth Point Heater Drain Pump 'A' trips on electrical fault

Which one of the following describes the effect on the Condensate Demineralizer differential pressure (D/P) and the required actions?

A. D/P lowers, remove Demineralizers as necessary

B. D/P rises, open Condensate Demineralizer Bypass Valve

C. D/P rises, place in service standby Demineralizers as necessary

D. D/P lowers, verify closed Condensate Demineralizer Bypass Valve

Proposed Answer: C

Explanation (Optional):

A. Incorrect - This is the inverse of the correct answer; D/P rises, add demins to service.

B. Incorrect - Condensate Demineralizer Bypass Valve is not opened under these conditions.

C. Correct - With the plant at power, approximately 2/3 of the total Feedwater system flow passes through the deep bed demineralizers. The additional 1/3 of total Feedwater system flow is provided by the Fourth Point Heater drain flow, which enters the Condensate system downstream of the demineralizers. Based on the loss of the pumping forward by one heater drain pump. Condensate System Flow rises and causes a higher demineralizer D/P and a drop in Booster Pump Suction pressure. Placing

additional demineralizers in service will restore system D/P.

D. Incorrect - D/P rises

Technical Reference(s): N2-ARP-851400, 851403
N2-OP-5, pg 3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # WTSI 2868
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 5
55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	215001 A4.03	
	Importance Rating	3.0	

Ability to manually operate and/or monitor in the control room: Isolation valves: Mark-I&II(Not-BWR1) (Traversing In-core Probe)

Proposed Question: RO Question # 38

The plant is at 100% power with LPRM calibration in progress. Conditions are as follows:

- Traversing Incore Probe System B (TIP B) is being used in the MANUAL Mode
- The TIP neutron detector probe is being inserted and has just reached the bottom core limit

Then...

A LOCA causes drywell pressure to rise to 5 psig.

Which one of the following describes how the TIP B system will respond to the high drywell condition?

A. TIP B automatically reverses direction and retracts into the shielded chamber
The TIP indexer nitrogen purge valve will automatically close.

B. TIP B automatically reverses direction and retracts into the shielded chamber
The TIP indexer nitrogen purge valve will stay open but may be manually closed if necessary.

C. TIP B continues inserting into the core
Manual action is required to retract TIP B into the shielded chamber
The TIP indexer nitrogen purge valve will automatically close

D. TIP B continues inserting into the core
Manual action is required to retract TIP B into the shielded chamber
The TIP indexer nitrogen purge valve will stay open but may be manually closed if necessary.

Proposed Answer: A

Explanation (Optional):

A. Correct. The TIP system responds to a Group 3 isolation signal, (high drywell, level 2)

signal. When a Group 3 isolation signal is received, any TIP probe inserted past its shielded chamber will automatically shift to reverse and fully retract back to its shielded chamber. The nitrogen purge valve will also automatically close.

B. Incorrect. The nitrogen purge valve will automatically close.

C. Incorrect. Although the TIP system is in MANUAL, the TIP system will immediately shift to reverse and retract back to its shielded chamber.

D. Incorrect. Although the TIP system is in MANUAL, the TIP system will immediately shift to reverse and retract back to its shielded chamber.

Technical Reference(s): TIP Lesson Plan, Obj. 5 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: N2-215001-RBO-05 (As available)

Question Source: Bank #

Modified Bank #

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 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295037 EK1.06	
	Importance Rating	4.0	

Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Cooldown effects on reactor power

Proposed Question: RO # 39

The plant has experienced a FAILURE TO SCRAM. Conditions are as follows:

- RPV pressure is stable at 900 psig
- The CRS has given the order to cooldown to cold shutdown conditions.

While cooling down the following is observed when pressure reaches 500 psig:

- Power on IRMs and SRMs begins to rise
- Period indication is 100 seconds

Which one of the following is required by N2-EOP-C5, Failure to Scram?

A. Stop the cooldown and STABILIZE pressure at 500 psig

B. Stop the cooldown, RAISE pressure back to 900 psig and STABILIZE

C. CONTINUE the cooldown at the CURRENT rate. If power goes above IRM range 6, then stop the cooldown

D. CONTINUE the cooldown but at a LOWER rate. If power goes above IRM range 6, then stop the cooldown

Proposed Answer: A

Explanation (Optional):

A. Correct. Per N2-EOP-C5, if the reactor goes critical during cooldown, then pressure must be stabilized below 1052 psig. The EOP bases state that stabilizing pressure would be to pick a value close to the initial value but below the SCRAM setpoint. Since initial RPV pressure at the time of criticality is 500 psig, then stabilizing at 500 psig would be appropriate.

B. Incorrect. Pressure must be stabilized at 500 psig, not 900 psig.

C. Incorrect. The cooldown must be stopped. Plausible in that when IRMs are on range 6

the reactor can be considered shutdown per EOP-C5. With the reactor subcritical on range 6 or below, the CRS can give the order to cooldown.

D. Incorrect. The cooldown must be stopped. Plausible in that when IRMs are on range 6 the reactor can be considered shutdown per EOP-C5. With the reactor subcritical on range 6 or below, the CRS can give the order to cooldown.

Technical Reference(s): N2-EOP-C5 and EOP Bases Page 12-67 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP 2101-EOPC5C01, N2-EOP-C5, FAILURE TO SCRAM, EO-2, Operational Actions and Sequence (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295001 AK1.01	
	Importance Rating	3.5	

Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Natural circulation

Proposed Question: RO # 40

The plant was at 18% power when a FWLC failure caused RPV level to lower and a Recirc Flow Control Valve Runback occurred. Conditions are as follows:

- Power is at 15%
- Core flow is at 19.5 Mlbs/hr

Per N2-SOP-29, Sudden Reduction in Core Flow, which one of the following actions is REQUIRED to be done first?

A. INSERT the first four CRAM rods

B. PLACE the mode switch in shutdown

C. MONITOR for core oscillations and SHIFT APRM recorders to fast speed

D. TAKE manual control of FWLC and RAISE RPV water level to reset the runback

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible if a candidate mis-plots on the power to flow map, and finds himself in the OPRM dependent Stability region, then the immediate action is to insert the first four CRAM rods

B. Correct. Plotting the power and core flow on the two loop power to flow map shows they are to the left of the Natural Circ Line, (Scram Region). N2-SOP-29 requires the reactor to be scrammed if the plant is operating in the Scram Region.

C. Incorrect. The required action is to insert a manual scram. Plausible in that the crew will monitor for core oscillations however shifting the APRM recorders to fast speed is only required in Attachment 1 and only if in the heightened awareness region and <3 OPRMS are operable.

D. Incorrect. The required action is to insert a manual scram. Plausible in that taking manual control of FWLC and raising RPV water level to reset the runback would normally be required.

Technical Reference(s):	N2-SOP-29 and EM-950A	(Attach if not previously provided)
Proposed References to be provided to applicants during examination:		Drawing EM-950A Two Loop Power to Flow Map.
Learning Objective:		(As available)
Question Source:	Bank #	
	Modified Bank #	(Note changes or attach parent)
	New X	
Question History:		
Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis X	
10 CFR Part 55 Content:	55.41 10	
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

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: RO # 41

Per N2-OP-97, 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 re-pressurize.

C. To allow reactor water level to recover above the scram setpoint.

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

Proposed Answer: A

Explanation (Optional):

A. Correct: Per N2-OP-97, The purpose of the ten second time delay is to allow sufficient time for the rods to scram prior to allowing for the scram to be reset.

B. Incorrect: Not a reason provided in N2-OP-97. The air header will remain de-pressurized until after the scram is reset.

C. Incorrect: Plausible in that regardless of the 10 second timer, the scram could not be reset until the level is recovered.

D. Incorrect: Not reason provided in N2-OP-97.

Technical Reference(s): N2-OP-97, P&L 6.0 (Attach if not previously provided)

Proposed References to be provided to applicants during examination:		None	
Learning Objective:	LP, N2101212000C01, Reactor Protection System, RBO-5, System Operation, Control and Instrumentation	(As available)	
Question Source:	Bank #	WTS 10666	
	Modified Bank #		(Note changes or attach parent)
	New		
Question History:		Hope Creek 2009 NRC	
Question Cognitive Level:	Memory or Fundamental Knowledge	X	
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	6	
	55.43		

Design, components, and function of reactivity control mechanisms and instrumentation.

Comments:

C. Incorrect: The Fast Closure scram is bypassed at 30% power as sensed by turbine 1st stage pressure. Plausible in that 25% is the capacity of the bypass valves.

D. Correct: The Power Load Unbalance circuit requires at least a 40% difference. The Fast Closure scram is bypassed at 30% power as sensed by turbine 1st stage pressure.

Technical Reference(s): EHC Lesson Plan, Obj. 2 and 7 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101248000C01), EHC, RBO-5, System Operation, Control and Instrumentation (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295018 AK2.02	
	Importance Rating	3.4	

Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER and the following: Plant operations

Proposed Question: RO # 43

The plant is at rated conditions with Turbine Building Closed Loop Cooling (CCS) pumps 2CCS-P1A and B in service and 2CCS-P1C in standby when the following indications and reports are received:

- Annunciator TURBINE BLDG CLOSED LOOP COOLING SYS TROUBLE, 601244, alarms
- The alarm is determined to be due to low surge tank level
- CCS surge tank make-up valve is reported to be open but surge tank level continues to drop rapidly
- A leak is reported on the CCS common pump discharge header

Assuming that conditions do not improve:

(1) What will be the impact on the CCS system

AND

(2) What actions are required by station procedures?

A. (1) 2CCS-P1A and B pumps will begin to cavitate. Pump 2CCS-P1C will auto start
(2) Place all three CCS pumps in Pull to Lock and commence a rapid power reduction

B. (1) 2CCS-P1A and B pumps will trip. Pump 2CCS-P1C may auto start but will then trip
(2) Scram the reactor and immediately break condenser vacuum to slow the turbine

C. (1) 2CCS-P1A and B pumps will begin to cavitate. Pump 2CCS-P1C will auto start and then will begin to cavitate
(2) Place all three CCS pumps in Pull to Lock and scram the reactor

D. (1) 2CCS-P1A and B pumps will trip. Pump 2CCS-P1C may auto start but will then trip
(2) Scram the reactor and trip the main turbine

Proposed Answer: D

Explanation (Optional):

A. Incorrect: As the surge tank empties, suction pressure will drop. Running pumps will trip on low suction pressure. Standby pump will be inhibited from starting due to the low suction pressure.

B. Incorrect: Standby pump will be inhibited from starting due to the low suction pressure. Additionally, although N2-SOP-14, directs monitoring of the turbine for high vibration, vacuum is only broken if vibration is expected to exceed 30 mils (N2-OP- 21, section H.5)

C. Incorrect: As the surge tank empties, suction pressure will drop. Running pumps will trip on low suction pressure. Standby pump will be inhibited from starting due to the low suction pressure.

D. Correct: As the surge tank empties, suction pressure will drop. Running pumps will trip on low suction pressure. Standby pump may try to auto start but will trip on low suction pressure. N2-SOP-14 directs that when all pumps are lost that the reactor be scrammed and the main turbine be tripped.

Technical Reference(s): N2-SOP-14, LOSS OR DEGRADED CCS SYSTEM, for actions when all pumps are lost. (Attach if not previously provided)

LP N2101274000C01, CCS, pages 67 and 68 for description of low suction pressure interlocks

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101274000C01, CCS, RBO-10, Operational Actions and Sequence (As available)

Question Source: Bank # X

Modified Bank # (Note changes or attach parent)

New

Question History: #16 on 2010 Audit

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content:	55.41	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295026 EK2.02	
	Importance Rating	3.6	

Knowledge of the interrelations between SUPPRESSION POOL HIGH WATER TEMPERATURE and the following: Suppression pool spray: Plant Specific

Proposed Question: RO # 44

The plant is shutdown following a LOCA. Conditions are as follows:

- RHS A and B are in suppression pool cooling
- Flow in RHS A and B systems are both at 7450 gpm with all flow going through the RHS heat exchangers
- The Service Water system is aligned for maximum flow through the RHS heat exchangers
- The CRS has determined suppression chamber sprays are needed and suppression pool cooling is still needed from both RHS systems.

Regarding the above:

(1) Per the Unit 2 Technical Specification Bases, how many RHS loops are required to be in Suppression Chamber Spray mode in order to compensate for potential steam bypass leakage into the Suppression Chamber

AND

(2) How will this impact the amount of heat removed from the Suppression Pool if Suppression Chamber Spray is initiated IAW EOP-6 Attachment 22, Containment Sprays?

A. (1) One loop
(2) Amount of heat removed lowers

B. (1) Two Loops
(2) Amount of heat removed lowers

C. (1) One loop
(2) Amount of heat removed is approximately the same

D. (1) Two Loops
(2) Amount of heat removed is approximately the same

Proposed Answer: C

Explanation (Optional):

A. Incorrect: Heat removal remains the same. Plausible if the candidate does not understand the RHS system configuration and the location of the flow elements.

B. Incorrect: Only one loop is required. Additionally heat removal remains the same.

C. Correct: Per Tech Spec Bases B 3.6.2.4, in the event of a DBA, a minimum of one RHR suppression pool spray subsystem is required to mitigate potential bypass leakage paths and maintain the primary containment peak pressure below the design limits. If suppression chamber spray is initiated while in suppression pool cooling, then the flow rate through the heat exchanger remains the same. That is, after spray is initiated, flow through the heat exchanger is adjusted to 7450 gpm which is the flow rate while in suppression pool cooling.

D. Incorrect: Only one loop is required as described above.

Technical Reference(s): Tech Spec Bases B 3.6.2.4 (Attach if not previously provided)

EOP-6 Attachment 22

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101205000C01, Residual Heat Removal System, RBO-5, System Operation, Control and Instrumentation (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 8

55.43

Components, capacity, and functions of emergency systems.
Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	295016	AK3.03	
	Importance Rating	3.5		

Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT: Disabling control room controls

Proposed Question: RO # 45

Following a fire in the main control room, N2-SOP-78 Control Room Evacuation directs that the Appendix R Disconnect switches be placed in the ACTUATE position

When placed in ACTUATE, these switches ...

A. install separate auto isolation circuits to ensure that fire damage will prevent required system isolations.

B. install separate auto initiation circuits to ensure that fire damage will prevent automatic ECCS system initiations.

C. prevent the spurious actuation of safety-related equipment required for safe shutdown that could result from automatic signals generated from a damaged control and/or relay room.

D. disable control room controls for ALL systems not operated from the Remote Shutdown Panel so that fire induced circuit faults associated with these controls will not complicate efforts in stabilizing plant operation.

Proposed Answer: C

Explanation (Optional):

A. Incorrect: These switches disable isolation signals for systems operated from the Remote shutdown panel (RSS).

B. Incorrect: These switches disable automatic initiation signals for LPCI, LPCS, ADS and RCIC. Separate circuits are not enabled.

C. Correct: One of the functions of the appendix R disconnect switches is to prevent spurious actuation of safety systems needed to safely shutdown and cooldown the reactor.

D. Incorrect: These switches do not isolate all controls for systems not controlled from the RSS. For example, HPCS is not controlled from the RSS and its controls are not disabled. They do isolate those controls of systems that ARE controlled from the RSS.

Technical Reference(s): RSS Lesson Plan, Obj. 2 (Attach if not previously provided)

USAR chapter 7 page 303 of 705

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101296000C01, Remote Shutdown System, RBO-2, Function and Location of Major Components (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295025 EK3.08	
	Importance Rating	3.5	

Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE: Reactor/turbine pressure regulating system operation

Proposed Question: RO # 46

Given the following:

- A plant startup is in progress
- Reactor power is 26%
- Power ascension is on hold while engineering investigates a main generator winding issue
- The Load Limit has been lowered to limit generator load to 250 MWE
- The LOAD LIMIT LIMITING light is illuminated
- The MAXIMUM COMBINED FLOW LIMIT is set to control at 115%

Then ...

- A failure associated with Recirc Flow Control causes reactor power to rise by 10%.

Which one of the following is correct regarding the response of the Electrohydraulic Control System?

A. The control valves will not open any further. The bypass valves will open as required to control pressure.

B. The control valves will not open any further and the bypass valves will not open. The reactor will scram on high pressure.

C. Pressure will rise until the backup pressure regulator takes control and stabilizes pressure by opening the bypass valves.

D. The control valves will open an additional amount until the 250 MWE Load Limit is reached. The bypass valves will then open as required to control pressure.

Proposed Answer: A

Explanation (Optional):

A. Correct: The control valves are already at their opening limit as evidenced by the Load Limit Limiting light being illuminated and will not open any further. Since the control valves cannot open the system will open the bypass valves to control the pressure rise. A 10% power rise is within the capability of the bypass valves.

B. Incorrect: Although the load limit limits the control valves from opening it will not impact the bypass valves. Since the Max Combined Flow Limit is set to control at 115%, the bypass valves will open.

C. Incorrect: Both regulators will respond the same to the pressure rise. However the backup rise has a negative bias associated with its output that lowers its output to less than the in-service regulator. Since the output of the two regulators is sent to a high value gate the in-service regulator will remain in control.

D. Incorrect: The control valves are already at their opening limit as evidenced by the Load Limit Setting light being illuminated.

Technical Reference(s): ARP-85100, 851150 (Attach if not previously provided)
EHC Lesson Plan, Obj. 2 and 5

Proposed References to be provided to applicants during examination: None

Learning Objective: EHC, (As available)
RBO-5, System Operation, Control and Instrumentation

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 5

55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes,

effects of load changes, and operating limitations and reasons for these operating characteristics.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295019 AK3.03	
	Importance Rating	3.2	

Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Service air isolations: Plant-Specific

Proposed Question: RO # 47

The plant is at rated power. Conditions are as follows:

- An air line break causes Instrument Air pressure to lower to 82 psig.

Which of the following actions will have automatically occurred in an attempt to maintain air pressure?

Action 1: Lag compressor starts
Action 2: Backup compressor starts
Action 3: In-service Air Dryer swaps towers
Action 4: 2IAS-AOV171, service air isolation valve closes

A. Actions 1, 3 and 4 only

B. Actions 1, 2 and 3 only

C. Actions 1, 2 and 4 only

D. Actions 1, 2, 3 and 4

Proposed Answer: C

Explanation (Optional):

A. Incorrect. The IAS air dryers will not swap towers, they have to be manually swapped if a high differential pressure occurs.

B. Incorrect. The IAS air dryers will not swap towers, they have to be manually swapped if a high differential pressure occurs.

C. Correct: The lag compressor starts at 100 psig and lowering. The Backup air compressor starts and the service air isolates when pressure lowers to 85 psig.

D. Incorrect. The IAS air dryers will not swap towers, they have to be manually swapped if a high differential pressure occurs.

Technical Reference(s):	N2-SOP-19, Loss of Instrument Air, section 2.0, Automatic Responses	(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective:	LP N2101278001C01, Service Instrument and Breathing Air	(As available)

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

Question History: Not used

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

10 CFR Part 55 Content:	55.41	4
	55.43	

Secondary coolant and auxiliary systems that affect the facility.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295028 EA1.01	
	Importance Rating	3.8	

Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell spray: Mark-I&II

Proposed Question: RO # 48

The plant is shutdown following a LOCA. Conditions are as follows

- Drywell sprays were initiated when drywell temperature exceeded 250 degrees
- Drywell temperature and pressure are now lowering

IAW N2-EOP-PC, drywell sprays are REQUIRED to be secured ...

A. before drywell pressure lowers to zero psig.

B. before the suppression chamber to drywell vacuum breakers lift.

C. when primary containment pressure goes negative relative to the secondary containment.

D. when drywell temperature and pressure lower to the BAD region of the Drywell Spray Initiation Limit curve.

Proposed Answer: A

Explanation (Optional):

A. Correct: Per the NMP2 EOP Bases document: The operation of drywell sprays must be terminated by the time pressure decreases to 0 psig in the drywell to ensure that primary containment pressure is not reduced below atmospheric. Maintaining a positive pressure provides a positive margin to the negative design pressure of the primary containment (-4.7 psig). This action is directed by step N2-EOP-PC, DWT-4.

B. Incorrect: The vacuum breakers lifting is an expected occurrence when spraying the drywell. Plausible in that the vacuum breakers lifting is what keeps it from going necgative.

C. Incorrect: Drywell sprays must be secured before pressure drops to zero psig – i.e., before it goes negative.

D. Incorrect: This action is not specified. Plausible in that this is a requirement for initiating sprays. This limit is only applicable prior to spray initiation.

Technical Reference(s): N2-EOP-PC, step DWT-4. (Attach if not previously provided)

NMP2 EOP Bases document, page 5-9

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:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295021 AA1.03	
	Importance Rating	3.1	

Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING: Component cooling water systems: Plant-Specific

Proposed Question: RO # 49

The plant is in Mode 4 with RHS B aligned for shutdown cooling. Conditions are as follows:

- A loss of electrical power to Division I caused a reduction in service water flow to RHS Heat Exchanger B.

Per N2-OP-31 RESIDUAL HEAT REMOVAL SYSTEM, what is the MAXIMUM allowed RHS Heat Exchanger service water outlet temperature under these conditions?

A. 130 °F

B. 148 °F

C. Within 100 °F of REACTOR water temperature

D. Within 100 °F of Heat Exchanger service water INLET temperature

Proposed Answer: A

Explanation (Optional):

A. Correct: IAW N2-OP-31, Precautions and Limitations number 1.0, this is the maximum allowed RHR HX service water outlet temperature. This temperature limit is due to pipe design limits of the Service Water system.

B. Incorrect: The limit is 130 degrees. Plausible in that 148 degrees is a limit within the procedure but applies to RHR Pump maximum continuous ambient temperature.

C. Incorrect: The limit is 130 degrees. Plausible in that that this is a limit within the procedure but applies to RHR Heat Exchanger outlet temperature and is applicable during initial system startup.

D. Incorrect: The limit is 130 degrees.

Technical Reference(s):	N2-OP-31, Precautions and Limitations number 1.0	(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective:	LP N2101205000C01, RBO-9, Precautions, Limitations and Operations Fundamentals	(As available)

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

Question History:

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

10 CFR Part 55 Content:	55.41	8
	55.43	

Components, capacity, and functions of emergency systems

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	295004	AA1.02	
	Importance Rating	3.8		

Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Systems necessary to assure safe plant shutdown

Proposed Question: RO # 50

Given the following:

- A plant transient has occurred requiring entry into the EOPs
- RHS Pump B and C are the ONLY ECCS pumps running
- EOPs require that an RPV blowdown be executed.

Just prior to the blowdown, a complete loss of Division II 125 VDC occurs.

The ADS Valves can be opened by:

1	Energizing their "A" solenoids by placing the keylock switches on panel PNL 628 to the OPEN position
2	Energizing their "B" solenoids by placing the keylock switches on panel PNL 631 to the OPEN position
3	Arming and depressing ADS Logic Channels “A” and “E” pushbuttons on PNL 601
4	Arming and depressing ADS Logic Channels “B” and “F” pushbuttons on PNL 601

A. Only 1

B. Only 1 or 3

C. Only 1, 2, or 3

D. Only 1, 2, or 4

Proposed Answer: A

Explanation (Optional):

A. Correct. With loss of Division II DC power, the B solenoids do not have power to open. Since the only running pumps are in Division II, the ADS pushbuttons on P601 for Division I will not work. The only remaining method is the keylock switches on P628.

B. Incorrect. The Division I ADS pushbuttons do not work since only Division II pumps are operating.

C. Incorrect. The B ADS solenoids do not have DC power to open.

D. Incorrect. The B ADS solenoids do not have DC power to open even though the Division II ECCS pumps are running.

Technical Reference(s): ADS Lesson Plan, Obj. 8 (Attach if not previously provided)
N2-SOP-04, Attachment 2, Page 19

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # Western Technical Services Bank 2859
Modified Bank # (Note changes or attach parent)
New

Question History: Question #4 on 2010 Audit
NRC Exam 2005

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

10 CFR Part 55 Content: 55.41 7
55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295031 EA2.01	
	Importance Rating	4.6	

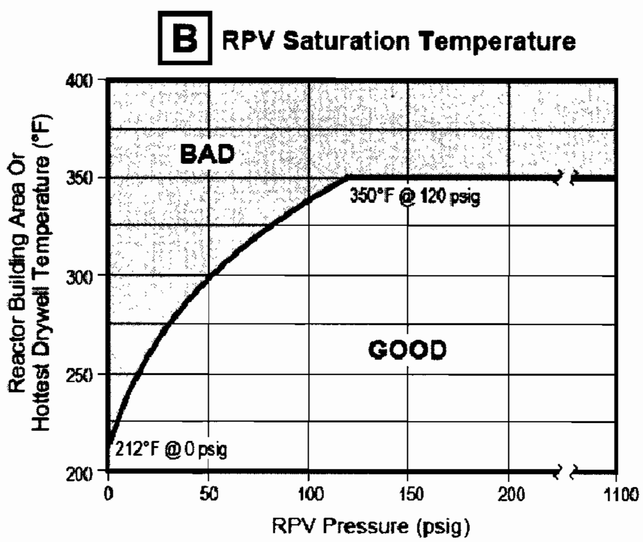
Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL: Reactor water level

Proposed Question: RO # 51

The plant has experienced a LOCA. The following conditions exist

- Drywell Temperature is 310°F
- RPV Pressure is 50 psig
- ECCS Systems are injecting into the RPV
- Wide Range RPV water level is 30 inches and steadily rising
- Fuel Zone instruments read upscale

Which one of the following describes the current requirement regarding entry into RPV Flooding EOP and why?



A. RPV Flooding must be entered because parameters are in the BAD region of RPV Saturation Temperature curve and reference leg flashing IS occurring.

B. RPV Flooding must be entered because parameters are in the BAD region of RPV Saturation Temperature curve even though reference leg flashing IS NOT occurring.

C. RPV Flooding entry is NOT required because water level readings are above Minimum Indicated Level values even though reference leg flashing IS occurring.

D. RPV Flooding entry is NOT required because water level readings are above Minimum Indicated Level values and reference leg flashing IS NOT occurring.

Proposed Answer: D

Explanation (Optional):

A. Incorrect - RPV Flooding is NOT required based solely on being in the BAD region of Fig B Detail A. As long as NO evidence that instrument leg boiling is taking place exists.

B. Incorrect - RPV Flooding is NOT required based solely on being in the BAD region of Fig B Detail A. As long as NO evidence that instrument leg boiling is taking place exists.

C. Incorrect - There is NO evidence that instrument leg boiling is taking place and the instrument reads above Minimum Indicated Level (Table C) for the Wide Range.

D. Correct - Conditions are above DETAIL A's Saturation Temperature Curve of EOP-PC and RPV. Although elevated DWT and low RPV pressure can result in flashing there is no evidence of flashing on the Wide Range instruments. The Caution states that Level instruments can only be used if "there is NO evidence of instrument leg flashing AND the instrument reads above the Minimum Indicated Level (Table C). Since there is NO evidence that instrument leg boiling is taking place on the Wide Range and Wide Range level is above the minimum indicated value of 25 inches, level can be determined.

Technical Reference(s): N2-EOP-RPV Detail A (Attach if not previously provided)
NER-2M-039

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # # 146

Modified Bank # (Note changes or attach parent)

	New	
Question History:		
Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	X
10 CFR Part 55 Content:	55.41	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	295023	AA2.01	
	Importance Rating	3.6		

Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS: Area radiation levels

Proposed Question: RO # 52

The plant is in Mode 5 performing a reactor cavity drain down IAW N2-PM-082, RPV Flood Up / Draindown.

Which one of the following will occur if the drain down is terminated 2 feet below the reactor flange?

A. Exposure of the moisture separator which results in high radiation levels on the refuel floor.

B. Exposure of the steam dryer which results in higher radiation levels and potential high airborne activity.

C. Loss of minimum reactor level above the fuel which results in high radiation levels on the refuel floor.

D. Loss of reference leg for the shutdown level indication which results in a loss of Control Room level indication.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: The concern with lowering cavity level below the flange is exposing the steam dryer; the moisture separator is located below the steam dryer and is not exposed.

B. Correct: Inadequate monitoring of RPV level while performing drain down may result in exposing the steam dryer resulting in higher radiation levels and high airborne activity. During a 2002 event at the Fitzpatrick plant, cavity level was lowered approximately 20 inches below the target level (top of RPV Flange). This exposed about 12 inches of the highly contaminated RPV Steam Dryer to the atmosphere for about 17 minutes and resulted in high radiation levels and contamination in parts of the reactor building.

C. Incorrect: The shutdown level indicator would not be appreciably affected by the draindown and is considered inoperable before and during the draindown.

D. Incorrect: There is no appreciable change in refueling floor radiation levels based on terminating the draindown 1 foot below the reactor flange.

Technical Reference(s): N2-PM-082 (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:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 12

55.43

Radiological safety principles and procedures.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295038 EA2.04	
	Importance Rating	4.1	

Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Source of off-site release

Proposed Question: RO # 53

The plant is operating at rated power. Conditions are as follows:

- Stack WRGMS radiation reading is normal
- Vent WRGMS radiation reading is higher than normal

Which one of the following identifies the possible release source?

A. Standby Gas Treatment fan discharge.

B. Main Steam Tunnel Ventilation exhaust.

C. Above Refuel Floor Ventilation exhaust.

D. Mechanical Vacuum Pump discharge.

Proposed Answer: C

Explanation (Optional):

A. Incorrect - This system discharges to the Main Stack via their respective ventilation systems.

B. Incorrect – This system discharges to the Main Stack via their respective ventilation systems.

C. Correct - the Above Refuel Floor Ventilation exhaust discharges to the Reactor/Radwaste Building Vent Stack.

D. Incorrect - This system discharges to the Main Stack via their respective ventilation systems.

Technical Reference(s): N2-OP-79, Page 13. (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101272000C01, Radiation Monitoring System, RBO-8, Interrelated Systems (As available)

Question Source: Bank #

Containment Bank # 148

Modified Bank # (Note changes or attach parent)

New

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 11

55.43

Purpose and operation of radiation monitoring systems, including alarms and survey equipment.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295030 2.4.46	
	Importance Rating	4.2	

Emergency Procedures / Plan: Ability to verify that the alarms are consistent with the plant conditions. (Low Suppression Pool Water Level)

Proposed Question: RO # 54

The plant was at rated power when a seismic event occurred. Conditions are as follows:

- The reactor is shutdown following a suppression pool leak.
- Annunciator 601550, SUPPRESSION POOL WATER TEMP HIGH/HIGH is in alarm
- Suppression pool water temperature as indicated on 2CEC*PNL601 is reading 105°F
- Suppression pool water level as indicated on 2CEC*PNL601 is reading 196 feet and stable
- No low pressure ECCS pumps are running

Which one of the following correctly identifies the validity of the SUPPRESSION POOL WATER TEMPER HIGH/HIGH annunciator and the Suppression Pool Temperature Indications on 2CEC*PNL601?

	Alarm	**Pool Temperature Indications**
A.	Valid	Valid
B.	Valid	Invalid
C.	Invalid	Valid
D.	Invalid	Invalid

Proposed Answer: D

Explanation (Optional):

A. Incorrect: Neither the alarms or indicators are valid. The lowest sensor of any pool temperature is at a pool level of 197 feet, (the temperature sensors for 601550 are at 199 feet)

B. Incorrect: Neither the alarms or indicators are valid. The lowest sensor of any pool temperature is at a pool level of 197 feet, (the temperature sensors for 601550 are at 199 feet)

C. Incorrect: Neither the alarms or indicators are valid the lowest sensor of any pool temperature is at a pool level of 197 feet, (the temperature sensors for 601550 are at 199 feet)

D. Correct: Neither the alarms or indicators are valid. The lowest sensor of any pool temperature is at a pool level of 197 feet, (the temperature sensors for 601550 are at 199 feet)

Technical Reference(s): N2-OP-82, CONTAINMENT ATMOSPHERIC MONITORING SYSTEM, page 5
N2-EOP-PC
ARP 601550
(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101223001C01, Primary Containment and Suppression Pool, RBO-12, EOP Implementation (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 9

55.43

Shielding, isolation, and containment design features, including access limitations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295005 2.4.31	
	Importance Rating	4.2	

Emergency Procedures / Plan: Knowledge of annunciator alarms, indications, or response procedures, (Main Turbine Generator Trip)

Proposed Question: RO # 55

A plant startup is in progress. Conditions are as follows:

- The Main Turbine is being rolled IAW N2-OP-21, Main Turbine System
- Turbine speed is currently 1800 RPM

Then....

- Annunciator 851140 TURBINE GENERATOR VIBRATION HIGH alarms

Per ARP 851140, the turbine should be tripped if any vibration level is ≥ __(1)__ mils for 15 minutes and vacuum in the main condenser should be broken if vibration levels are projected to go above __(2)__ mils following a turbine trip.

	(1)	(2)
A.	3	12
B.	3	30
C.	10	12
D.	10	30

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Plausible in that the 3 mils for tripping the turbine could be confused with the 3 mils/min requirement for tripping the turbine when >9mils. Additionally, 12 mils for breaking vacuum could be confused with the 12 mils for an immediate turbine trip.

B. Incorrect. Plausible in that the 3 mils for tripping the turbine could be confused with the 3 mils/min requirement for tripping the turbine when >9 mils.

C. Incorrect. Plausible in that the 12 mils for breaking vacuum could be confused with the 12 mils for an immediate turbine trip.

D. Correct: Per ARP 851140 and OP-21, P&L 27.0 and 28.0, the turbine should be tripped with vibration levels above 10 mils for 15 minutes AND vacuum should be broken if the vibration levels are projected to go above 30 mils.

Technical Reference(s): 851140 TURBINE GENERATOR VIBRATION HIGH (Attach if not previously provided)

N2-OP-21, precautions 27 and 28

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101245000C01, Main Turbine, RBO-11, System Loss and Component Level Malfunction (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295024 2.1.23	
	Importance Rating	4.3	

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation. (High Drywell Pressure)

Proposed Question: RO # 56

The plant is at 100% power. Conditions are as follows:

- Annunciator 601260, DRYWELL UNIT COOLERS LEAKAGE HIGH, alarmed
- CCP*MOV265/273 and CCP*MOV122/ 124, Unit Coolers RBCLC Supply and Return valves were closed
- Highest Drywell Temperature is 140 °F and slowly rising
- Drywell pressure is 0.8 psig and slowly rising

Per N2-SOP-60, Loss of Drywell Cooling, which of the following actions are required to restore the Drywell Unit Cooler Fans to service and lower drywell temperature and pressure?

	Override Switches	Required Action
A.	Place UNIT COOLER FANS GR1 and GR2 LOCA OVERRIDE switches to Override.	Verify that the Drywell Unit Cooler Fans auto start.
B.	Place UNIT COOLER FANS GR1 and GR2 LOCA OVERRIDE switches to Override.	Then restart the Drywell Unit Cooler Fans.
C.	Place DRYWELL UNIT COOLER WTR DIV I and DIV II LOCA OVERRIDE switches to Override.	Then restart the Drywell Unit Cooler Fans.
D.	Place UNIT COOLER FANS GR1 and GR2 LOCA OVERRIDE switches AND the DRYWELL UNIT COOLER WTR DIV I and DIV II LOCA OVERRIDE switches to Override.	Verify that the Drywell Unit Cooler Fans auto start.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: The fans auto tripped when the CCP valves were closed. The fans will not auto-start when the UNIT COOLER FANS GR1 and GR2 LOCA OVERRIDE switches

are placed in override.

B. Correct: Since only the fans are being restored, N2-SOP-60 directs that the UNIT COOLER FANS GR1 and GR2 LOCA OVERRIDE be operated. Additionally, because the fans tripped, the fans must be restarted.

C. Incorrect: The DRYWELL UNIT COOLER WTR DIV I and DIV II LOCA OVERRIDE switches override the LOCA signal to the CCP valves to re-open them with a LOCA signal present. The UNIT COOLER FANS GR1 and GR2 LOCA OVERRIDE switches must be operated to restart the fans with the CCP valves closed.

D. Incorrect: The DRYWELL UNIT COOLER WTR DIV I and DIV II LOCA OVERRIDE switches are not required to be operated. Additionally, the fans will not auto start as discussed above.

Technical Reference(s): N2-SOP-60, LOSS OF DRYWELL COOLING (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101223004C01, Drywell Cooling, RBO-5, System Operation, Control and Instrumentation. (As available)

Question Source: Bank # X

Modified Bank # (Note changes or attach parent)

New

Question History: # 57 on 2010 Audit Exam

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

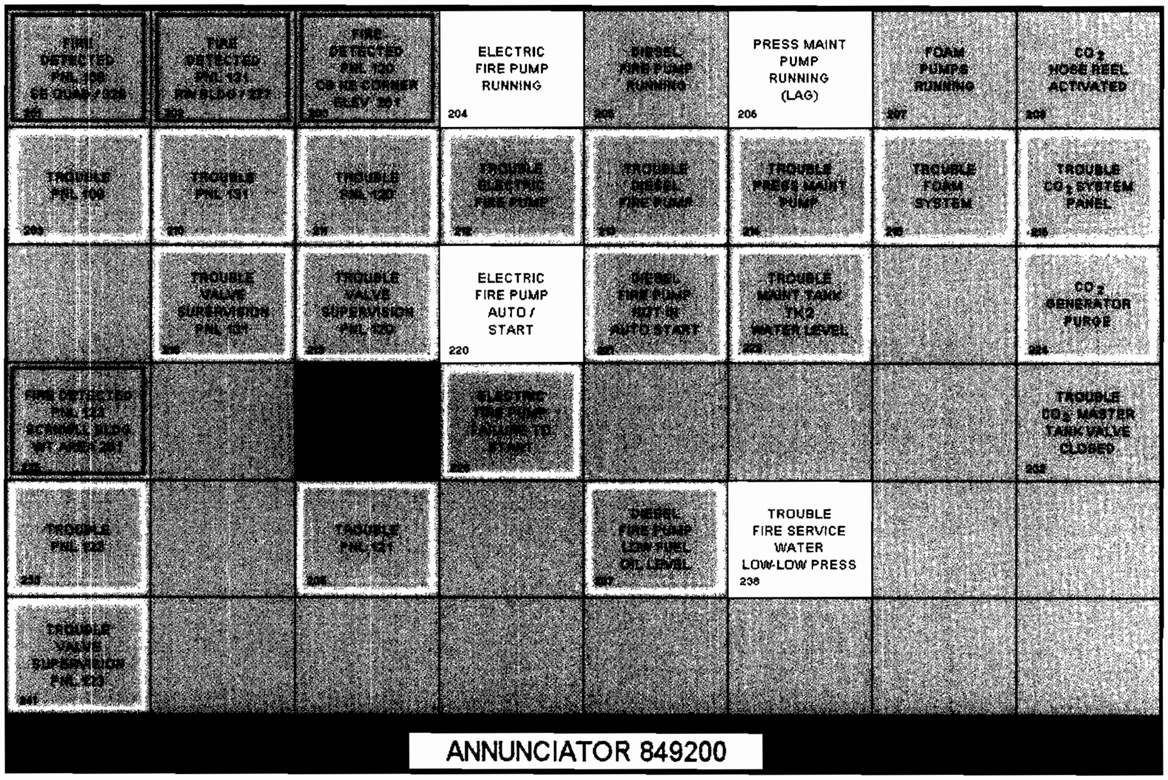
Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	600000 AK3.04	
	Importance Rating	2.8	

Plant Fire On-site / 8: Knowledge of the reasons for the following responses as they apply to PLANT FIRE ON SITE: Actions contained in the abnormal procedure for plant fire on site
Proposed Question: RO # 57

The plant is at 100% power when the following indications are observed on 2CEC*PNL849:



Indications for ZONE 505 SW FPW-MOV172A, 172B on the sloping section of 2CEC*PNL849 show that the header is pressurized.

The Fire Brigade Leader reports that ZONE 505SW XFMR 2STX-XNS1 is in alarm at the Local Fire Panel.

Per EPIP-EPP-28, FIRE FIGHTING, the control room staff ___(1)___ call this a CONFIRMED FIRE because ___(2)___.

A. (1) SHOULD NOT
(2) suppression system actuation and flow CANNOT be confirmed.

B. (1) SHOULD NOT
(2) the Fire Brigade Leader has not reported back to the control room that an actual fire exists.

C. (1) SHOULD
(2) the alarm at the Local Fire Panel indicates that there is an actual fire.

D. (1) SHOULD
(2) a fire has been detected and there is indication of suppression system activation with flow.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Per EPIP-EPP-28, a fire can be called CONFIRMED provided the following exists; Fire Alarm/Annunciator and suppression system activation accompanied by actual flow or discharge. Having the electric fire pump start and ZONE 505 indicating the header is pressurized is sufficient to show suppression system activation with actual flow.

B. Incorrect. Although the FBL can call a fire confirmed, the control room staff can also call the fire confirmed if there are indications in the control room consistent with a Fire Alarm/Annunciator and suppression system activation accompanied by actual flow or discharge.

C. Incorrect. A local fire panel alarm is not sufficient to call a fire confirmed.

D. Correct. Per EPIP-EPP-28, a fire can be called CONFIRMED provided the following exists; Fire Alarm/Annunciator and suppression system activation which is indicated by annunciator 849227, FIRE DETECTED PNL121 CB W CORRIDOR ELEV/261, accompanied by actual flow or discharge. Having the electric fire pump start, determined by annunciator 849204 and ZONE 505 indicating the header is pressurized, is sufficient to show suppression system activation with actual flow. ZONE 505SW XFMR 2STX-XNS1 is a deluge system for the Station Service Transformer once this system is pressurized there will be flow because all the nozzles are open.

Technical Reference(s): EPIP-EPP-28 (Attach if not previously provided)

ARP 849227

PID-043C

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:

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

10 CFR Part 55 Content:	55.41	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295003 AK1.01	
	Importance Rating	2.7	

Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: Effect of battery discharge rate on capacity

Proposed Question: RO # 58

Given the following:

- Station Blackout conditions exist
- No operator actions have been taken in N2-SOP-01, Station Blackout
- RCIC is about to be placed in service
- Both Division 1 and 2 125 VDC batteries were fully charged prior to the Station Blackout
- Battery discharge rates for both Division 1 and 2 batteries are equal

After the start of RCIC...

(1) Which battery will reach its minimum terminal voltage first

AND

(2) How long is that battery designed to maintain terminal voltage above that value following the complete loss of AC power?

A. (1) Division 1
(2) At least 2 hours

B. (1) Division 1
(2) At least 4 hours

C. (1) Division 2
(2) At least 2 hours

D. (1) Division 2
(2) At least 4 hours

Proposed Answer: A

Explanation (Optional):

A. Correct: The only RCIC MOV supplied by Division 2 (2BYS*SWG002B) is one of the 2 turbine exhaust vacuum breakers. All the remaining loads including lights and indication are supplied from Division 1 (SWG002A). Therefore Div I Battery will discharge faster than the Div II Battery. The batteries provide power for large load starting transients, and all DC loads in the event of AC power failure, for at least 2 hours following a loss of chargers provided that the battery had been fully charged.

B. Incorrect - The batteries provide power for large load starting transients, and all DC loads in the event of AC power failure, for at least 2 hours following a loss of chargers provided that the battery had been fully charged.

C. Incorrect - Div I Battery will discharge faster than the Div II Battery.

D. Incorrect - Div I Battery will discharge faster than the Div II Battery. The batteries provide power for large load starting transients, and all DC loads in the event of AC power failure, for at least 2 hours following a loss of chargers provided that the battery had been fully charged

Technical Reference(s): DC Distribution Lesson Plan, Obj. 2 (Attach if not previously provided)

RCIC Lesson Plan, Obj. 4

N2-OP-74A, System Description

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:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 8

55.43

Components, capacity, and functions of emergency systems.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295022 AK1.01	
	Importance Rating	3.3	

Knowledge of the operational implications of the following concepts as they apply to LOSS OF CRD PUMPS: Reactor pressure vs. rod insertion capability

Proposed Question: RO # 59

A reactor startup is in progress. Conditions are as follows:

- Reactor pressure is 600 psig
- The following then occurs:

Time	Event
07:05	2RDS-P1A ROD DRIVE PUMP trips on low suction pressure. Operators are dispatched to swap RDS suction strainers
07:10	Accumulator trouble alarms are received for withdrawn control rods 42-19, 02-23, and 10-15.
07:15	A Plant Operator reports the following accumulator pressures to the control room: 42-19: 970 psig 02-23: 910 psig 10-15: 920 psig

Per N2-SOP-30 Control Rod Failures, when must the mode switch be placed in SHUTDOWN?

A. 07:10

B. 07:15

C. 07:25

D. 07:30

Proposed Answer: B

Explanation (Optional):

A. Incorrect: A scram is required at 07:15. Accumulator trouble alarms annunciate at 1000

psig accumulator pressure. In order to call an accumulator inoperable, pressure must be <940 psig, which requires a report from the field. Plausible in that because RPV pressure is <900 psig, a scram is required immediately after determining at least one accumulator for a withdrawn control rod is inoperable. If the candidate incorrectly correlates an accumulator trouble alarm to an inoperable accumulator, then they could choose this distracter.

B. Correct. A loss of a running RDS pump will cause charging water header pressure to go immediately <940 psig. At 07:15, a report from the PO gave two accumulator pressures <940 psig which makes them inoperable. Per the N2-SOP-30 override, a scram is required immediately if these conditions exist.

C. Incorrect. A scram is required at 07:15. Plausible in that if the candidate does not remember to take into account that RPV pressure is <900 psig, they may choose to apply the charging header pressure <940 psig for 20 minutes which would require placing the mode switch in shutdown at 07:25.

D. Incorrect. A scram is required at 07:15. Plausible in that if the candidate does not remember to take into account RPV pressure is <900 psig and they do not understand that accumulator trouble alarms do not immediately require declaring an accumulator inoperable then they may choose this distracter

Technical Reference(s): SOP-30, Control Rod Failures (Attach if not previously provided)
ARP 603441

Proposed References to be provided to applicants during examination: None

Learning Objective: O2 OPS-001-201-2-01, EO-1.8 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295012 AK2.01	
	Importance Rating	3.4	

Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Drywell ventilation

Proposed Question: RO # 60

Which one of the following lists the drywell temperature that above which the Drywell Ventilation system CANNOT be used per N2-EOP-6 Attachment 24, Drywell Unit Cooler Operation With LOCA Signal?

A. 150°F

B. 200°F

C. 250°F

D. 340°F

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Plausible because 150°F is an entry condition for EOP-PC.

B. Incorrect. Plausible because 200°F is the TS value for transitioning between mode 3 and 4.

C. Correct. Per EOP-6, with temperature above 250°F, water hammer may occur in the CCP piping, so restoration of drywell ventilation cannot be performed.

D. Incorrect. Plausible because 340°F is the highest temperature in EOP-PC before which a blowdown must be performed.

Technical Reference(s): N2-EOP-6, Attachment 24 (Attach if not previously provided)

Proposed References to be provided to applicants during examination:			None
Learning Objective:	LP N2101223004C01, Drywell Cooling, RBO-12, EOP Implementation		(As available)
Question Source:	Bank #		
	Modified Bank #		(Note changes or attach parent)
	New	X	
Question History:			
Question Cognitive Level:	Memory or Fundamental Knowledge	X	
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	10	
	55.43		

Administrative, normal, abnormal, and emergency operating procedures for the facility

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295009 AK3.02	
	Importance Rating	2.7	

Knowledge of the reasons for the following responses as they apply to LOW REACTOR WATER LEVEL: Reactor feedpump runout flow control: Plant-Specific.

Proposed Question: RO # 61

The plant is at 100% power. Conditions are as follows:

- A spurious turbine trip occurs
- Annunciator 851539, REAC FEED PMP 1A/1B/1C SUCTION PRESS LOW/LO-LO alarms
- Feed pump suction pressure is 200 psig and stable

Which one of the following (1) describes the response of the feedwater control system and (2) per N2-OP-3 Condensate and Feedwater System, what is the reason for this response?

A. (1) The high pressure high flow control valves (LV 10A, B & C) close and the controllers shift to MANUAL.
   (2) To minimize the possibility of Feed Pump cavitation.

B. (1) The high pressure high flow control valves (LV 10A, B & C) close and the controllers shift to MANUAL.
   (2) To prevent feedwater pump runout.

C. (1) The high pressure high flow control valves (LV 10A, B & C) are limited to a maximum of 70% open.
   (2) To minimize the possibility of Feed Pump cavitation.

D. (1) The high pressure high flow control valves (LV 10A, B & C) are limited to a maximum of 70% open.
   (2) To prevent feedwater pump runout.

Proposed Answer: C

Explanation (Optional):

A. Incorrect: The logic output clamps the high pressure high flow control valves (LV 10A, B & C) to a maximum of 70% open (48% flow).

B. Incorrect: IAW N2-OP-03, The Feed Pump Flow Limiter Logic minimizes the possibility of Feed Pump cavitation. The logic output clamps the high pressure high flow control valves (LV 10A, B & C) to a maximum of 70% open (48% flow).

C. Correct: IAW N2-OP-03, The Feed Pump Flow Limiter Logic minimizes the possibility of Feed Pump cavitation anytime a low Feed Pump suction pressure is present concurrently with a Main Turbine trip. With this logic engaged, flow is limited through the Feed Pump thus restoring NPSH at the pump suction. The logic is automatically bypassed when either initiating condition is clear. When actuated, the logic output clamps the high pressure high flow control valves (LV 10A, B & C) to a maximum of 70% open (48% flow).

D. Incorrect: The Feed Pump Flow Limiter Logic minimizes the possibility of Feed Pump cavitation.

Technical Reference(s): Feedwater Lesson Plan, Obj. 8 (Attach if not previously provided)
N2-ARP-851500, 851539
N2-OP-3, page 9

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:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 4

55.43

Mechanical components and design features of reactor primary system.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295035 EA1.01	
	Importance Rating	3.6	

Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Secondary containment ventilation system

Proposed Question: RO # 62

The plant is operating at rated power. Conditions are as follows:

- A swap of the operating Reactor Building ventilation (HVR) exhaust fans is performed.
- Reactor Building differential pressure changes from -0.6" to -0.25" WG

Which one of the following identifies the automatic response of the Reactor Building Ventilation system and the Standby Gas System (GTS) to the change in Reactor Building differential pressure?

	HVR MOD17A/B, VENT SUPPLY AIR RECIRC DAMPER RESPONSE	**GTS RESPONSE**
A.	Modulates Open	Starts
B.	Modulates Close	Starts
C.	Modulates Open	Remains in Standby
D.	Modulates Close	Remains in Standby

Proposed Answer: C

Explanation (Optional):

A. Incorrect - GTS will not auto start on high (less negative) building dp. Plausible in that if a GTS initiation signal is present the standby GTS will start on low dp.

B. Incorrect: GTS will not auto start on high (less negative) building dp. Plausible in that if a GTS initiation signal is present the standby GTS will start. Additionally, HVR MOD17A/B bypasses the supply fans discharge back to the fan intake. The damper closing would bypass less flow, increasing the supply to the building and causing pressure to rise even further in the building.

C. Correct: HVR MOD17A/B will modulate open to reduce intake air flow to the reactor building. This will result in driving the differential pressure back in the negative direction via the exhaust fans. GTS will not start on high (less negative) building dp.

D. Incorrect: HVR MOD17A/B bypasses the supply fans discharge back to the fan intake. The damper closing would bypass less flow, increasing the supply to the building and causing pressure to rise even further in the building.

Technical Reference(s): N2-OP-52, Reactor Building Ventilation, page 7 (Attach if not previously provided)
N2-OP-61B, Standby Gas Treatment, page 5
RB Ventilation Lesson Plan Obj. 2

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101288001C01, Reactor Building Ventilation, RBO-5, System Operation, Control and Instrumentation (As available)

Question Source: Bank # Question # 142, Containment Bank
Modified Bank # (Note changes or attach parent)
New

Question History:

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

10 CFR Part 55 Content: 55.41 9
55.43

Shielding, isolation, and containment design features, including access limitations.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295033 EA2.01	
	Importance Rating	3.8	

Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: Area radiation levels

Proposed Question: RO # 63

The plant is operating at 100% power, when the following sequence occurs:

Time	Event
0800	• The Reactor Building isolates on high exhaust radiation.
0805	• Reactor Water Cleanup System WCS Pump Room A temperature is 160 degrees F and steady • Reactor Water Cleanup failed to isolate both automatically and manually.
0820	• Radiation monitor RMS2A on Reactor Building Elevation 215 is reading 9.2 E+03 mR/hr steady and indicating RED on DRMS display • Radiation monitor RMS2B on Reactor Building Elevation 215 is reading 8.2 E+03 mR/hr steady and indicating RED on DRMS display

Which one of the following describes the proper implementation of EOP-SC with regards to area radiation levels?

S	Maximum Safe Values	
Parameter	**Location**	**Maximum Safe Value**
Area Temperature (EOP-6 Att 28)	All areas	212°F
	Areas when access is required for support of EOP actions.	135°F
Area Radiation	All areas	8.00E+3 mR/hr
Area Water Level	All areas	Flooding alarm

A. Only one area is affected by elevated radiation levels. Continue to try to isolate WCS system. A normal plant shutdown is NOT required.

B. Two areas are affected by elevated radiation levels. A normal plant shutdown IS required. RPV Blowdown is NOT required.

C. Only one area is affected by elevated radiation levels. A manual scram IS required but an RPV Blowdown is NOT required.

D. Two areas are affected by elevated radiation levels. A manual scram IS required AND an RPV Blowdown IS required.

Proposed Answer: D

Explanation (Optional):

A. Incorrect: Two areas are affected. Plausible in that both areas are on the same elevation.

B. Incorrect: A scram is required via EOP-RPV because a primary system is discharging. Plausible in that this would be the correct answer if the candidate does not consider WCS as a primary system.

C. Incorrect: Two areas are affected. Additionally, a blow down is required. Plausible in that if the candidate considers that only one area is impacted and correctly determines that a primary system is discharging, this would be the correct answer.

D. Correct: Per the TMG page 39, each area radiation monitor is treated as a separate area. Since RMS2A and 2B are reading above Max Safe Values, then 2 areas are affected. Because WCS (Reactor Water Cleanup) is a primary system entry into N2-EOP-RPV is required via EOP-SC, step 8, which will require a scram. Because 2 areas are above Max Safe a Blowdown is required by EOP-SC Step SC-10.

Technical Reference(s): GAI-OPS-20 Page 39 (Attach if not previously provided)

N2-EOP-SC, Secondary Containment Control

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2-EOP-SC, SECONDARY CONTAINMENT CONTROL, EO-2, Operational Actions and Sequence (As available)

Question Source: Bank # X

	Modified Bank #	(Note changes or attach parent)
	New	

Question History:

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

10 CFR Part 55 Content:	55.41	
	55.43	13

Procedures and equipment available for handling and disposal of radioactive materials and effluents.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295008 2.4.34	
	Importance Rating	4.2	

Emergency Procedures / Plan: Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects. (High Reactor Water Level)

Proposed Question: RO # 64

The plant is shutdown and the control room evacuated after a fire in the control room. Conditions are as follows:

- RCIC is being operated from the remote shutdown panel IAW N2-SOP-78, Control Room Evacuation
- RPV level is 200 inches and rising
- The RCIC Flow controller thumbwheel is set in AUTO at 400 gpm
- RCIC Turbine speed is 1500 RPM
- RPV Level continues to rise

IAW N2-SOP-78, what actions are required to maintain RPV level in band?

A. Trip the turbine using the manual trip pushbutton.

B. Close 2ICS*MOV120 TURB STM SUPPLY VLV.

C. Adjust Flow Controller thumbwheel setpoint to 300 gpm.

D. Place Flow Controller to MANUAL and lower turbine speed.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: Tripping the turbine is not required per SOP-78 and if injection needs to be restored, the trip and throttle valve would have to be reset.

B. Correct: Per SOP-78. If speed cannot be maintained above 1500 RPM and level continues to rise then close the Steam Admission Valve MOV120.

C. Incorrect: Lowering thumbwheel setting to 300 gpm violates the procedure conditional statement that if lowering flow below 400 gpm, the controller should be placed in manual to prevent system flow oscillations. Also would result in speed below 1500

RPM.

D. Incorrect: Lowering turbine speed below 1500 RPM and violate the low RPM procedure limit of 1500 RPM.

Technical Reference(s): N2-SOP-78 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101296000C01, Remote Shutdown System RBO-10, Operational Actions and Sequence (As available)

Question Source: Bank # X

Modified Bank # (Note changes or attach parent)

New

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295002 AK1.03	
	Importance Rating	3.6	

Knowledge of the operational implications of the following concepts as they apply to LOSS OF MAIN CONDENSER VACUUM: Loss of heat sink

Proposed Question: RO # 65

A plant startup is in progress with the following:

- Reactor power is 18%
- A Main Condenser leak develops
- Condenser vacuum rapidly lowers to 8.0 inches Hg.

With no operator action, which one of the following describes the conditions that would exist following this event?

The reactor has…

A. scrammed and decay heat is being removed using the SRV's.

B. scrammed and decay heat is being removed by Turbine Bypass Valves.

C. NOT scrammed and reactor pressure is being controlled by Turbine Bypass Valves.

D. NOT scrammed and reactor pressure is being controlled by the Turbine Control Valves.

Proposed Answer: A

Explanation (Optional):

A. Correct: When condenser vacuum reaches is 22.1 inches Hg the Main turbine will trip. At 8.5 inches Hg the MSIV's will shut. At 18% power the Mode Switch will be in run which will cause a Rx scram when the MSIV's shut. The Bypass valves will not fail shut on low vacuum but with the MSIV's shut they will not provide for pressure control. Therefore pressure will be controlled using the SRVs.

B. Incorrect - At 18% power the Mode Switch will be in run which will cause a Rx scram when the MSIV's shut. The Bypass valves will not fail shut on low vacuum but with the MSIV's shut will not provide for pressure control. Therefore pressure will be controlled using the SRVs.

C. Incorrect - At 18% power the Mode Switch will be in run which will cause a Rx scram when the MSIV's shut. The Bypass valves will not fail shut on low vacuum but with the MSIV's shut will not provide for pressure control. Therefore pressure will be controlled using the SRVs.

D. Incorrect - At 18% power the Mode Switch will be in run which will cause a Rx scram when the MSIV's shut. The Bypass valves will not fail shut on low vacuum but with the MSIV's shut will not provide for pressure control. Therefore pressure will be controlled using the SRVs.

Technical Reference(s): N2-SOP-09 (Attach if not previously provided)
N2-SOP-21

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # N2-255000-RBO-10-Q01
Modified Bank # (Note changes or attach parent)
New

Question History:

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

10 CFR Part 55 Content: 55.41 5
55.43

Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.1.42	
	Importance Rating	2.5	

Conduct of Operations: Knowledge of new and spent fuel movement procedures.

Proposed Question: RO # 66

The plant is in MODE 5 with refueling activities in progress on the Refuel Floor.

Per N2-FHP-003, REFUELING MANUAL which one of the following is considered a CORE ALTERATION?

A. Removal of an LPRM string.

B. Withdrawal of a control rod from a cell containing no fuel.

C. Reseating of a fuel bundle in the core with the refuel mast.

D. Movement of a recently irradiated fuel bundle in the Fuel Pool.

Proposed Answer: C

Explanation (Optional):

A. Incorrect: As defined in the Refueling Manual, movemement of LPRMs does not constitue a core alteration.

B. Incorrect: As defined in the Refueling Manual, movement of a control rod in a cell that does not contain any fuel does not constitue a core alteration.

C. Correct: As defined in the Refueling Manual, this constitues a core alteration in that it is the movement of fuel, within the reactor vessel with the vessel head removed. The Fleet Reactivity Procedure requires that a licensed RO or certified fuel handling/refueling operator perform core alterations.

D. Incorrect: As defined in the Refueling Manual this does not constitute a core alteration as the fuel move is occurring in the spent fuel pool.

Technical Reference(s): N2-FHP-003, Refueling Manual, page 5 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: Describe the terms listed in the Definitions section 1.1 of NMP2 Technical Specifications. (As available)

Question Source: Bank # #13, Admin Bank

Modified Bank # (Note changes or attach parent)

New

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.1.4	
	Importance Rating	3.3	

Conduct of Operations: 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: RO # 67

Per S-ODP-TQS-0101, Administrative Controls for Maintaining Active License Status at NMP, what is the MINIMUM number of 12-hour shifts a licensed operator would have to stand in a calendar quarter in order to maintain an active license?

A. 5

B. 7

C. 9

D. 11

Proposed Answer: A

Explanation (Optional):

A. Correct. Per S-ODP-TQS-0101, Section 4.4, an operator has to stand at least 5 12-hour shifts in order to maintain an active license.

B. Incorrect. Per S-ODP-TQS-0101, Section 4.4, an operator has to stand at least 5 12-hour shifts in order to maintain an active license.

C. Incorrect. Per S-ODP-TQS-0101, Section 4.4, an operator has to stand at least 5 12-hour shifts in order to maintain an active license.

D. Incorrect. Per S-ODP-TQS-0101, Section 4.4, an operator has to stand at least 5 12-hour shifts in order to maintain an active license.

Technical Reference(s): S-ODP-TQS-0101, Section 4.4 (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:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10

55.43

Administrative, normal, abnormal, and emergency operating procedures for the facility.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.2.7	
	Importance Rating	2.9	

Equipment Control: Knowledge of the process for conducting special or infrequent tests.

Proposed Question: RO # 68

Per CNG-OP-4.01-1000, INTEGRATED RISK MANAGEMENT, who is allowed to conduct an Infrequently Performed Test or Evolution (IPTE) manager brief?

Only a…

A. Responsible Group Supervisor or above

B. Shift Manager or above

C. General Supervisor or above

D. Plant General Manager or above

Proposed Answer: C

Explanation (Optional):

A. Incorrect; Per CNG-OP-4.01-1000, IPTE briefs shall be conducted at the GS level or above.

B. Incorrect; Per CNG-OP-4.01-1000, IPTE briefs shall be conducted by the GS level or above.

C. Correct: Per CNG-OP-4.01-1000, IPTE briefs shall be conducted by the GS level or above.

D. Incorrect; Per CNG-OP-4.01-1000, IPTE briefs shall be conducted by the GS level or above.

Technical Reference(s): CNG-OP-4.01-1000 (Attach if not previously provided)

Proposed References to be provided to applicants during examination:			None
Learning Objective:			(As available)
Question Source:	Bank #	WTS Bank 4588	
	Modified Bank #		(Note changes or attach parent)
	New		
Question History:			
Question Cognitive Level:	Memory or Fundamental Knowledge	X	
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	10	
	55.43		

Administrative, normal, abnormal, and emergency operating procedures for the facility.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.2.40	
	Importance Rating	3.4	

Equipment Control: Ability to apply technical specifications for a system.

Proposed Question: RO # 69

The plant is at rated conditions with testing in progress which adds heat to the suppression pool.

Which one of the following is the LOWEST suppression pool temperature above which Technical Specifications requires an IMMEDIATE manual scram be inserted?

A. 90°F

B. 110°F

C. 115°F

D. 120°F

Proposed Answer: B

Explanation (Optional):

A. Incorrect: Plausible in that this is the EOP entry condition for high suppression pool temperature.

B. Correct: LCO 3.6.2.1 required action D.1 requires that the mode switch be immediately placed in shutdown.

C. Incorrect: LCO 3.6.2.1 required action D.1 requires a scram be inserted when temperature exceeds 110 degrees. Although a scram would be required at 115 degrees, it is not the lowest.

D. Incorrect: Plausible in that this is the value for depressurizing the reactor to less than 200 psig per LCO 3.6.2.1 required action D.1.

Technical Reference(s): LCO 3.6.2.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective:	LP N2101223001C01, Primary Containment & Suppression Pool, RBO-14, Application of Technical Specifications	(As available)

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

Question History: # 56, 2010 audit exam

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

10 CFR Part 55 Content:	55.41	9
	55.43	

Shielding, isolation, and containment design features, including access limitations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.3.15	
	Importance Rating	2.9	

Radiation Control: Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.
Proposed Question: RO # 70

With the Reactor Building Isolated and Standby Gas Treatment in service, which one of the following radiation monitors will STILL detect actual airborne radiation levels in the Reactor Building?

A. Standby Gas Treatment Monitor, GTS-RE105

B. Emergency Recirc Mode Monitor, HVR-RE229

C. Below Refuel Floor Monitors, HVR*RE32A and B

D. Main Stack Gaseous Effluent Monitor, 2RMS-RE193

Proposed Answer: B

Explanation (Optional):

A. Incorrect - Will indicate SGTS filtered outlet radiation levels, which are NOT representative of the Reactor Building.

B. Correct - 2HVR-CAB229 is used to monitor and trend Reactor Building Ventilation when the Reactor Building is isolated and a Emergency HVR Recirc Unit (2HVR*UC413A or B) is in service.

C. Incorrect - Has no air flow following isolation and SGTS initiation.

D. Incorrect - Will indicate stack effluent radiation levels, which are NOT representative of the Reactor Building.

Technical Reference(s): N2-ARP-85200, 851254 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101272000C01, Radiation Monitoring System, RBO-2, Function and Location of Major Components (As available)

Question Source: Bank # #281, Instrumentation Bank

Modified Bank # (Note changes or attach parent)

New

Question History: # 71 2009 Audit

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 11

55.43

Purpose and operation of radiation monitoring systems, including alarms and survey equipment.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.3.7	
	Importance Rating	3.5	

Radiation Control: Ability to comply with radiation work permit requirements during normal or abnormal requirements.

Proposed Question: RO # 71

The plant has experienced a radiation emergency. Conditions are as follows:

- An ALERT has been declared.
- An operator will be entering the RCIC pump room in order to operate a valve.
- It has been determined by RP that a Specific Radiation Work Permit, (RWP) is required to perform this work and that time does not permit for normal processing and development of the Specific RWP

Per EPIP-EPP-15, EMERGENCY HEALTH PHYSICS, who may give permission to modify the normal processing and development requirements for this Specific RWP?

A. The CRS

B. The Emergency Director

C. The Lead RP Technician on shift

D. The General Supervisor of Radiation Protection

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Only the ED, RM, or RAM may modify the processing requirements for RWP's

B. Correct. Per EPIP-EPP-15, RWP processing requirements may be modified by the ED if normal processing would result in unacceptable delays in emergency or critical path work.

C. Incorrect. Only the ED, RM, or RAM may modify the processing requirements for RWP's

D. Incorrect. Only the ED, RM, or RAM may modify the processing requirements for RWP's

Technical Reference(s): EPIP-EPP-15, Section 3.1 (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:

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

10 CFR Part 55 Content:	55.41	12
	55.43	

Radiological safety principles and procedures.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.4.21	
	Importance Rating	4.0	

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: RO # 72

The reactor is operating at rated power when annunciator 602116, RECIRC PMP 1B SEAL STAGING FLOW HIGH LOW, alarms. The following indications exist for Reactor Recirc Pump 1B:

- Seal staging flow is high (computer point RCSFC10)
- Lower (#1) Seal cavity pressure is 1020 psig
- Upper (#2) Seal cavity pressure is 830 psig

Which one of the following identifies the status of Reactor Recirc Pump B seals?

A. Only the lower seal is degraded

B. Only the upper seal is degraded

C. Both the upper and lower seals are partially degraded

D. Both the upper and lower seals have completely failed

Proposed Answer: A

Explanation (Optional):

A. Correct - As the lower seal degrades, its pressure drop goes down, resulting in the upper seal cavity pressure rising toward the lower seal cavity pressure. Staging flow rises as a result of the degraded lower seal; hence, the annunciator cited in the stem; in this case, for HI FLOW.

B. Incorrect - This answer is incorrect because a degraded upper seal would result in its seal cavity pressure lowering (towards Drywell atmospheric pressure), not rising toward lower seal pressure.

C. Incorrect – Both seal pressures would drop if they were degraded

D. Incorrect – Both seal pressures would be ~350 psig if they had both completely failed

Technical Reference(s): N2-SOP-29.1, pg 6

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source:	Bank #	X	Vision ID 53770
	Modified Bank #		(Note changes or attach parent)
	New		

Question History:

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

10 CFR Part 55 Content:	55.41	10
	55.43	

Administrative, normal, abnormal, and emergency operating procedures for the facility.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.4.20	
	Importance Rating	3.8	

Emergency Procedures / Plan: Knowledge of the operational implications of EOP warnings, cautions, and notes.
Proposed Question: RO # 73

N2-EOP-RPV, RPV Control contains a caution that RCIC operation with a high suction temperature may result in equipment damage.

(1) What is the value of suction temperature contained within the caution

AND

(2) What is the bases of the caution per NER-2M-039, EOP BASES?

A. (1) 125 °F
(2) Pump cavitation

B. (1) 140 °F
(2) Pump cavitation

C. (1) 125 °F
(2) Bearing damage and loss of turbine control

D. (1) 140 °F
(2) Bearing damage and loss of turbine control

Proposed Answer: D

Explanation (Optional):

A. Incorrect: The bases of the caution is bearing damage or loss of control oil function.

B. Incorrect: The bases of the caution is bearing damage or loss of control oil function

C. Incorrect: The limit is 140 degrees.

D. Correct: Per the EOP bases document, page 4-18, exceeding 140 degrees may cause system damage. Since lube oil and control oil are cooled by the water being pumped, high temperatures may result in bearing damage or loss of control capability.

Technical Reference(s):	NMP2 EOP Bases Document, page 4-18	(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective:	LP 2101-EOPRPVC01 , N2-EOP-RPV, RPV CONTROL, EO-2, Operational Actions and Sequence	(As available)

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

Question History:

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

10 CFR Part 55 Content:	55.41	8
	55.43	

Components, capacity, and functions of emergency systems

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.4.6	
	Importance Rating	3.7	

Emergency Procedures / Plan: Knowledge of EOP mitigation strategies.

Proposed Question: RO # 74

Per NER-2M-039, EOP BASES, which one of the following is the reason for spraying the drywell when suppression chamber pressure reaches 10 psig?

Spraying the drywell ensures that...

A. the differential pressure rating of the containment vents is not exceeded.

B. sufficient non condensable gases remain in the drywell to prevent chugging.

C. the negative design pressure of the containment is not exceeded when sprays are initiated.

D. the Primary Containment Pressure Limit is not exceeded during an emergency RPV depressurization.

Proposed Answer: B

Explanation (Optional):

A. Incorrect: This is a function of the Primary Containment Pressure Limit.

B. Correct: Per the EOP Technical bases, Drywell sprays are initiated when suppression chamber pressure exceeds 10 psig, the Suppression Chamber Spray Initiation Pressure (SCSIP), to preclude chugging - the cyclic condensation of steam at the downcomer openings.

C. Incorrect: This is a function of the Drywell Spray Initiation Limit.

D. Incorrect: This is a function of the Heat Capacity Temperature Limit.

Technical Reference(s): N2 EOP Technical Bases pages 5-26 and 5-27 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP 2101-EOPPCC01, N2-EOP-PC, PRIMARY CONTAINMENT CONTROL, EO-2, Operational Actions and Sequence (As available)

Question Source: Bank # X

Modified Bank # (Note changes or attach parent)

New

Question History: # 75 2010 Audit

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 9

55.43

Shielding, isolation, and containment design features, including access limitations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.2.37	
	Importance Rating	3.6	

Equipment Control: Ability to determine operability and / or availability of safety related equipment.

Proposed Question: RO # 75

What impact does losing 125 VDC control power have on a CLOSED 4KV safety-related load breaker?

A. Prevents remote AND local breaker operation. Breaker protective relaying is REMOVED.

B. Prevents remote AND local breaker operation. Breaker protective relaying remains AVAILABLE.

C. Prevents ONLY remote breaker operation. Local manual trip capability remains AVAILABLE. Breaker protective relaying is AVAILABLE.

D. Prevents ONLY remote breaker operation. Local manual trip capability remains AVAILABLE. Breaker protective relaying is REMOVED.

Proposed Answer: D

Explanation (Optional):

A. Incorrect: Plausible if the candidate does not realize that the opening springs are charged when the breaker is closed.

B. Incorrect: Plausible if the candidate assumes that the protective relaying is from AC power within the cubicle.

C. Incorrect: Combination of distracters A and B

D. Correct: Control power is necessary to electrically operate the breaker remotely. Since the breaker is closed, the opening springs are charged and trip capability remains using the local mechanical trip. The protective relaying requires control power to function.

Technical Reference(s): N2-OP-74A, Note on page 21 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP On-Site AC Distribution System, N2101264000C01, RBO-11, System Loss and Component Level Malfunction (As available)

Question Source: Bank # WTS # 12337

Modified Bank # (Note changes or attach parent)

New

Question History: 2009 Quad Cities Exam

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7

55.43

Design, components, and function of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295028 EA2.04	
	Importance Rating	4.2	

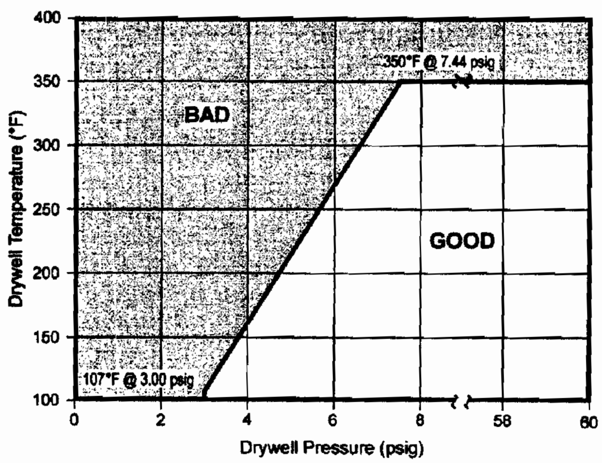
Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell pressure
Proposed Question: SRO # 76

The plant is shutdown following a LOCA. Conditions are as follows:

- Drywell temperature is 330°F and slowly rising
- Drywell pressure is 8 psig and slowly rising
- Suppression Pool Water Level is 220 feet and stable
- All drywell unit coolers tripped when drywell pressure exceeded 1.68 psig
- A and B Recirc pumps have been tripped due to high motor temperatures

Which one of the following actions should be taken to control DRYWELL TEMPERATURE?

K Drywell Spray Initiation Limit



A. Enter N2-EOP-C2, RPV Blowdown and blowdown the reactor.

B. Spray the drywell using RHS A or B per N2-EOP-6, Attachment 22, Containment Sprays.

C. Re-start all available drywell cooling per N2-EOP-6 Attachment 24, Operation of Drywell Cooler Units with LOCA Signal.

D. Vent and purge the containment per N2-EOP-06 Attachment 21, Containment Venting, and Attachment 25, Containment Purging.

Proposed Answer: A

Explanation (Optional):

A. Correct. Per N2-EOP-PC, because suppression pool water level is above 217 feet, the drywell cannot be sprayed. Additionally, since drywell temperature is above 250°F, the drywell unit coolers cannot be operated. Since both mitigation strategies in EOP-PC for lowering drywell temperature cannot be used and drywell temperature continues to rise, then Drywell temperature cannot be restored and MAINTAINED <340°F so a blowdown is required. Additionally, per the EOP BASES, "A determination that drywell temperature cannot be restored and maintained below 340°F may be made when, before, or after temperature actually reaches the value"

B. Incorrect. Since suppression pool water level is >217 feet, drywell sprays cannot be used. Plausible in that this would be an allowable if level were <217 feet.

C. Incorrect. Since Drywell temperature is >250°F, the drywell unit coolers cannot be operated. Plausible in that if drywell temperature were <250°F, then the drywell unit coolers could be operated.

D. Incorrect - These attachments are used for venting the primary containment to maintain pressure below the PCPL and for hydrogen gas control. They are not authorized for use in attempts to maintain containment temperature as their use would result in a release and the structural integrity of the containment is not immediately threatened.

Technical Reference(s): N2-EOP-PC (Attach if not previously provided)

EOP BASES Page 5-16

Proposed References to be provided to applicants during examination: None

Learning Objective: LP 2101-EOPPCC01, Primary Containment Control, EO-2, Operational Actions and Sequence (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

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

10 CFR Part 55 Content:	55.41	
	55.43	5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	1		
	K/A #	295005	AA2.05	
	Importance Rating	3.9		

Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP: Reactor power
Proposed Question: SRO # 77

The plant is starting up. Conditions are as follows:

- Reactor power is 22%
- A main generator trip occurs.

While monitoring 2CEC*PNL603 during the plant transient, the RO reports the following indications for RPS:

- The 4 RPS A pilot valve status lights on 2CEC*PNL603 are OFF
- The 4 RPS B pilot valve status lights on 2CEC*PNL603 are ON

Based on the above information, which one of the following is REQUIRED?

A. Enter N2-SOP-21, Turbine Trip and place the mode switch to shutdown. Enter N2-EOP-RPV, RPV Control after the scram.

B. Enter N2-SOP-21, Turbine Trip and N2-SOP-97 RPS Failures. After entry into N2-SOP-97, check for drifting control rods.

C. Enter N2-SOP-21, Turbine Trip. Enter N2-SOP-97 RPS Failures and trip RPS B. Enter N2-EOP-RPV, RPV Control after the scram.

D. Enter N2-EOP-RPV, RPV Control and insert a manual scram signal. If rods to not insert, enter N2-EOP-C5, Failure to Scram.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible in that entry into N2-SOP-21 is required due to the turbine trip and placing the mode switch to shutdown is required only if the turbine did not trip and power is >25%.

B. Correct: Entry into N2-SOP-21 is required based on the turbine tripping. Entry into

SOP-97 is required because RPS A has tripped. SOP-97 directs checking control rod positions for drifting control rods. No EOP entry conditions have been exceeded based on the information provided. RPS "A" should not have tripped because the reactor scram on turbine trip signal is bypassed less than 30% based on turbine 1st stage pressure.

C. Incorrect. Entry into SOP-21 is required. Plausible in that if RPS B failed to deenergize, it would be considered an RPS failure. Entry into SOP-97 is required, but not to trip RPS B. Entry into the EOP-RPV would be required if after the scram level lowered to <159 inches.

D. Incorrect: An EOP entry condition has not been exceeded. Plausible if the candidate believes that RPS should have tripped at this power level following the turbine trip. In that case a manual scram would be required.

Technical Reference(s): N2-SOP-21 (Attach if not previously provided)
N2-SOP-97

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:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	700000 AA2.09	
	Importance Rating	4.3	

Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Operational status of emergency diesel generators.

Proposed Question: SRO # 78

The plant is operating at rated power. Conditions are as follows:

- DG ENGINE CONTROL CKT CHANNEL A Inop status light illuminates
- The determination is made that the primary Emergency Starting Circuit for the Division I EDG has failed.
- The diesel's secondary Emergency Starting Circuit is confirmed to be functioning

Regarding the status of the Division 1 Diesel and its ability to respond to a loss of offsite power, which one of the following is correct?

The diesel...

A. remains operable because the secondary circuit is functioning.

B. is inoperable because the primary circuit has failed but is available because the secondary circuit is functioning.

C. is inoperable and not available because the primary circuit has failed and the secondary circuit is not capable of starting the diesel.

D. is inoperable because the primary circuit has failed but can be made operable via a compensatory measure of stationing an operator to manually start the diesel if required.

Proposed Answer: B

Explanation (Optional):

A. Incorrect - The Diesel is inoperable. Per N2-OP-100A, the diesel should be declared inoperable if the primary starting circuit fails. Plausible in that the secondary circuit will start the engine should an emergency start signal be received.

B. Correct - The Diesel is inoperable. Per N2-OP-100A, the diesel should be declared inoperable if the primary starting circuit fails. Both circuits are independently capable of starting the Diesel in the Emergency Mode and both circuits have this capability tested every 18 months {24 months}. The main difference between the two circuits is that the

Primary Circuit has additional circuitry to control the Governor in droop mode (Parallel Mode) as well as Isochronous Mode and to switch the Governor out of Parallel Mode into Isochronous Mode on a Loss of Offsite Power. The Redundant Circuit can control the Governor only in Isochronous Mode. Thus if the Primary Circuit is lost, the Governor will not operate in Parallel Mode. Although the secondary start circuit is capable of starting the Diesel independent of the primary start circuit, the Diesel should be declared inoperable if the primary start circuit is inoperable. This is because not all required portions of the secondary start circuit are surveiled. Since the Diesel is capable of auto starting, it can be declared available per CNG-OP-1.01-2002, Operations Shift Turnover and Relief

C. Incorrect - The Diesel is inoperable. Per N2-OP-100A, the diesel should be declared inoperable if the primary starting circuit fails. Plausible in that the secondary circuit will start the engine should an emergency start signal be received and there is an operable but degraded classification in CNG-OP-1.01-1002. However this condition would not meet the definition of this classification is because not all required portions of the secondary start circuit are surveiled as discussed below.

D. The Diesel is inoperable. Plausible in that CNG-OP-1.01-1002 addresses the use of comp measures. However a comp measure can only be used to return an inoperable component to an operable but degraded status.

Technical Reference(s): N2-OP-100A, Standby Diesel Generators, discussion item 11.0 on page 11.
CNG-OP-1.01-2002
(Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101264000C01, AC Emergency Distribution, RBO-14, Application of Technical Specifications (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 2

Facility operating limitations in the technical specifications and their bases.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295003 2.4.41	
	Importance Rating	4.6	

Emergency Procedures / Plan: Knowledge of the emergency action level thresholds and classifications. (Partial or Complete Loss of AC)
Proposed Question: SRO # 79

The plant is operating at rated conditions. Conditions are as follows:

- The Division III Diesel Generator is inoperable and unavailable due to maintenance.

The following sequence then occurs:

Time 00:00:
- A complete loss of offsite power results in a full load reject and reactor scram
- Division I EDG starts and energizes Division I switchgear
- Division II EDG starts but immediately trips

Time 00:30:
- Fuel oil leak in the Division I Diesel generator Room causes a large fire and loss of the Division I EDG

Time 01:00:
- The fire is extinguished

Time 01:30
- The Division II EDG is started and Division II switchgear is energized

IAW EPIP-EPP-02-EAL, which one of the following is correct?

Note: Apply all required time limits.

A. An Unusual Event EAL was first exceeded at 00:15.
An Alert EAL was not exceeded until 00:30.

B. An Unusual Event EAL was first exceeded at 00:15.
A Site Area Emergency EAL was not exceeded until 00:30.

C. An Alert EAL was first exceeded at 00:15.
A Site Area Emergency EAL was not exceeded until 00:45.

D. An Alert EAL was first exceeded at 00:15.
A Site Area Emergency EAL was not exceeded until 00:30.

Proposed Answer: C

Explanation (Optional):

A. Incorrect - Although UE EAL 6.2.1 was exceeded at time 00:15 due to the initial loss of offsite, Alert EAL, 6.1.3 was also exceeded at 00:15 when the only source of power was the Div 1 diesel and this condition had existed for 15 minutes. Plausible if the candidate focuses on the fire in the diesel room which is also an Alert based on EAL 8.2.2

B. Incorrect - Alert EAL, 6.1.3 was exceeded at 00:15 when the only source of power was the Div 1 diesel and this condition had existed for 15 minutes. A Site Area EAL was not exceeded until 00:45. Plausible if the candidate does not realize that the loss of all AC must exist for 15 minutes before the EAL is exceeded.

C. Correct - Alert EAL, 6.1.3 was exceeded at 00:15 when the only source of power was the Div 1 diesel and this condition had existed for 15 minutes. When the Div 1 diesel was lost at time 00:30, the 15 minute clock started for Site Area Emergency EAL 6.1.4 due to a loss of all AC power. 15 minutes later, at time 00:45, the EAL was exceeded.

D. Incorrect - The Site Area Emergency was not exceeded until 00:45.

Technical Reference(s): EPIP-EPP-02-EAL (Attach if not previously provided)

Proposed References to be provided to applicants during examination: EAL Chart

Learning Objective: (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295037 2.4.18	
	Importance Rating	4.0	

Emergency Procedures / Plan: Knowledge of the specific bases for EOPs. (SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown)
Proposed Question: SRO # 80

The plant was manually scrammed due to an un-isolable RCIC steam leak in the Reactor Building. Conditions are as follows:

- Reactor power is 6%
- Reactor level is 180 inches and stable
- RRCS failed to automatically and manually initiate
- MSIVs are open and reactor pressure is stable on the turbine bypass valves
- One Reactor Building area temperature is above its Max Safe Value
- A second Reactor Building area temperature is rising but below its Max Safe Value.

Which one of the following is (1) the REQUIRED action and (2) per NER-2M-039, EOP BASES, what is the bases for this action?

A. (1) IAW N2-EOP-C2 RPV Blowdown, open 7 ADS valves and depressurize the RPV
(2) This step is designed to reduce the driving head of the leak and minimize heat addition to the primary containment

B. (1) IAW N2-EOP-C5, anticipate the RPV Blowdown and rapidly depressurize the RPV using the main turbine bypass valves
(2) This step is designed to reduce the driving head of the leak and minimize heat addition to the primary containment

C. (1) IAW N2-EOP-C5, terminate and prevent all injection except from Boron, CRD and RCIC and lower RPV Level. Let level drop to below 100 inches
(2) This step is designed to uncover the feedwater sparger to minimize core oscillations

D. (1) IAW N2-EOP-C5, terminate and prevent all injection except from Boron, CRD and RCIC and lower RPV Level. Let level drop to below 100 inches
(2) This step is designed to lower reactor power by reducing natural circulation

Proposed Answer: C

Explanation (Optional):

A. Incorrect - EOP-SC directs that RPV Blowdown be entered WHEN two areas are above their Max Safe Operating Values. Only one area is above the max safe value.

B. Incorrect - Anticipating the RPV blow down is not authorized by the EOPs during failure to scram conditions. Plausible in that this action is authorized in N2-EOP-RPV.

C. Correct - With power above 4%, the Level Leg of N2-EOP-C5 directs lowering level to below 100 inches. Per the EOP bases document, steps L-5 and L-9 are designed to prevent or mitigate the consequences of any large irregular neutron flux oscillations induced by neutronic / thermal-hydraulic instabilities by lowering RPV water level sufficiently below the elevation of the feedwater sparger nozzles (100 inches). This places the feedwater spargers in the steam space providing effective heating of the relatively cold feedwater and eliminating the potential for high core inlet subcooling. For conditions that are susceptible to oscillations, the initiation and growth of oscillations is principally dependent upon the subcooling at the core inlet; the greater the subcooling, the more likely oscillations will commence and increase in magnitude.

D. Incorrect - The reason described in the distracter is for the EOP action to lower and control level to lower power by reducing natural circulation. This step is taken when heat addition to the primary containment is occurring, (i.e. 110°F suppression pool temperature). Plausible in that this is a common misconception with operators.

Technical Reference(s): N2-EOP-C5 (Attach if not previously provided)

N2-EOP-SC

N2 EOP bases document, page 12-18

Proposed References to be provided to applicants during examination: None

Learning Objective: LP 2101-EOPC5C01, N2-EOP-C5, FAILURE TO SCRAM, EO-2, Operational Actions and Sequence (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295016 2.4.11	
	Importance Rating	4.2	

Emergency Procedures / Plan: Knowledge of abnormal condition procedures. (Control Room Abandonment)
Proposed Question: SRO # 81

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

- Annunciator 849128, FIRE DETECTED PNL129 W STAIR/288 alarms
- A confirmed fire is reported in the Relay Room
- An electrical malfunction (hot short) in the Relay Room causes a complete loss of Reactor Building Closed Loop Cooling, RCIC, Division I and II systems.

Which one of the following is correct?

A. Evacuate the Control Room per N2-SOP-78 and establish plant control at the Remote Shutdown Panels.

B. DO NOT evacuate the control room. IAW N2-SOP-14, SCRAM the reactor, trip both Recirc pumps, and trip WCS.

C. DO NOT evacuate the control room. IAW N2-OP-78, Remote Shutdown System, control Division I, II, and RCIC components from the Remote Shutdown Panels.

D. Maintain the control room manned as long as the control room atmosphere remains acceptable. If the atmosphere becomes unacceptable, evacuate the Control room per N2-SOP-78 and establish plant control at the Remote Shutdown Panels.

Proposed Answer: A

Explanation (Optional):

A. Correct - SOP-78, Control Room entry is required for Annunciator 849128, FIRE DETECTED PNL129 W STAIR/288 in alarm. With any of the following conditions: Fire OR electrical malfunction (hot short) in the Main Control Room OR Relay Room which causes, OR has the potential to cause, a loss of control of systems required to safely shutdown the unit.

B. Incorrect – The control room must be evacuated per N2-SOP-78. Plausible in that if the control room was not evacuated, then they would take the actions per N2-SOP-13.

C. Incorrect – The control room must be evacuated. Plausible in that Division I and RCIC systems can be controlled from the Remote Shutdown Panels.

D. Incorrect – The control room must be evacuated. Plausible in that the fire is not in the control room.

Technical Reference(s): N2-SOP-78 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101296000C01, Remote Shutdown System RBO-10, Operational Actions and Sequence (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	295025 EA2.04	
	Importance Rating	3.9	

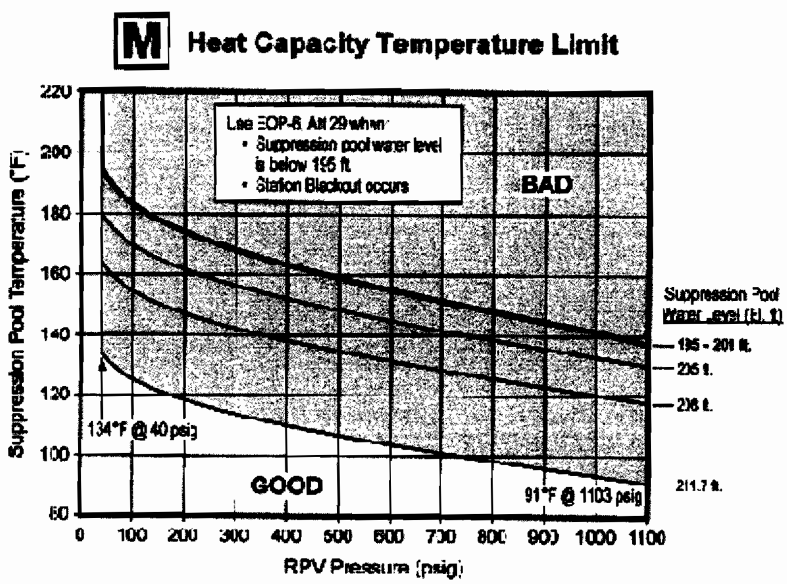
Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: Suppression pool level

Proposed Question: SRO # 82

The plant has experienced a Failure to Scram. Conditions are as follows:

- RPV pressure is 960 psig and stable.
- Containment parameters are as follows:
  - Suppression Pool Temperature: 100°F and slowly rising
  - Suppression Pool Water Level: 209 feet and stable
- RHS A is aligned for suppression pool cooling

Which one of the following describes the status of the Heat Capacity Temperature Limit (HCTL) and any actions required?



A. HCTL is being exceeded. Enter N2-EOP-C2, RPV Blowdown and blowdown the RPV.

B. HCTL is NOT being exceeded. Lower RPV pressure as necessary to prevent exceeding HCTL.

C. HCTL is being exceeded. Lower RPV pressure to restore and maintain RPV pressure to within HCTL. RPV blowdown is not required.

D. HCTL is NOT being exceeded. Place RHR "B" in suppression pool cooling and maximize cooling to both Heat Exchangers to lower suppression pool temperature to prevent exceeding HCTL.

Proposed Answer: A

Explanation (Optional):

A. Correct. Since HCTL is being exceeded, the action per N2-EOP-PC is to enter EOP-C2 and blowdown the reactor. Step SPT-6 of EOP-PC does not allow you restore and maintain, so if the limit is exceed, a blowdown is required.

B. Incorrect. HCTL is being exceeded. Plausible in that if HCTL were not being exceeded, lowering RPV pressure would be the right action.

C. Incorrect. Plausible if the candidate thinks that the parameters associated with HCTL can be restored and maintained vice just maintained.

D. Incorrect. HCTL is being exceeded. Plausible in that this is a required action per N2-EOP-PC per step SPT-3.

Technical Reference(s): N2-EOP-PC (Attach if not previously provided)
NER-2M-039 EOP BASES, pages 12-52 and 12-53

Proposed References to be provided to applicants during examination: None

Learning Objective: LP 2101-EOPPCC01, N2-EOP-PC, PRIMARY CONTAINMENT CONTROL, EO-2, Operational Actions and Sequence (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	X
10 CFR Part 55 Content:	55.41	
	55.43 5	

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295008 AA2.02	
	Importance Rating	3.4	

Ability to determine and/or interpret the following as they apply to HIGH REACTOR WATER LEVEL: Steam flow/feedflow mismatch
Proposed Question: SRO # 83

The plant is operating at 80% power. Conditions are as follows:

- Feed Pumps A and B are in service
- All Narrow Range Level Indicators indicate 188 inches and slowly rising
- INDICATIONS for FWLC are as follows:
  - "A" Feedwater Header flow is 6.7 X 10^6 lbm/hr and slowly rising
  - "B" Feedwater Header Flow is 5.5 X 10^6 lbm/hr and slowly lowering
  - ALL four Main Steam Line Flows are 3 X 10^6 lbm/hr and stable
  - The outputs of the Master Controller and the Individual M/A Controllers are ALL observed to be 43% and slowly rising

Based on the above indications and in addition to taking manual control of FWLC per N2-SOP-06;

(1) What additional action is required?

AND

(2) Why is that action necessary?

A. (1) IAW N2-OP-3, Condensate and Feedwater System, shift to Single Element Control AND return FWLC to auto.
(2) "A" Feedwater Header Flow instrument is failing upscale.

B. (1) IAW N2-OP-3, Condensate and Feedwater System, shift to Single Element Control AND return FWLC to auto.
(2) "B" Feedwater Header Flow instrument is failing downscale.

C. (1) IAW N2-SOP-06, Feedwater System Failures, Attachment 2, change MOV 47A to a throttle valve and reduce flow through LV10A.
(2) LV10A is locked up and drifting open.

D. (1) IAW N2-SOP-06, Feedwater System Failures, throttle "A" Feedwater Header flow with 2FWS*MOV21A, FD WTR TO REACTOR OUTBD ISOL VLV.

(2) LV10A is locked up and drifting open.

Proposed Answer: B

Explanation (Optional):

A. Incorrect - The "A" feedwater instrument is responding normally. If this instrument was failing upscale, FWLC would think that feed flow was greater than steam flow and close down on LV10B and C, causing actual level to lower. Plausible in that "A" line flow is reading higher than "B" line flow.

B. Correct - The "B" Feedwater Flow sensor is failing downscale. This is causing a sensed feed flow steam flow mismatch. FWLC is responding to the false mismatch by opening LV10A and B as evidenced by the increasing output signals. Since actual feed flow was already equal to steam flow, actual level begins to rise. N2-SOP-06, Feedwater System Failures, 4th override of the subsequent actions directs that if a feed flow or steam flow instrument is malfunctioning, then FWLC is to be shifted to single element control.

C. Incorrect - LV10A is not locked up. Plausible in that these valves when locked up do have a tendency to drift and "A" feed flow is higher than "B" feed flow. However this cannot be the cause as both feed flows would be increasing if the valve was locked up since the feed pumps discharge into a common header before splitting into the two headers downstream of the heaters. Additionally FWLC would respond by attempting to close down on LV10A and B, which is not the case since the output signals from the controllers are increasing.

D. Incorrect - LV10A is not locked up. Plausible in that these valves when locked up do have a tendency to drift and "A" feed flow is higher than "B" feed flow. However this cannot be the cause as both feed flows would be increasing if the valve was locked up since the feed pumps discharge into a common header before splitting into the two headers downstream of the heaters. Additionally FWLC would respond by attempting to close down on LV10A and B, which is not the case since the output signals from the controllers are increasing.

Technical Reference(s): FWLC Lesson Plan, Obj. 11 (Attach if not previously provided)

N2-SOP-06, Feedwater System Failures, flowchart

Proposed References to be provided to applicants during examination: None

Learning Objective: LP N2101259002C01, Feedwater Control System, RBO-11, System Loss and Component Level Malfunction (As available)

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

Question History:

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

10 CFR Part 55 Content:	55.41	
	55.43	5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #	1		
	Group #	2		
	K/A #	295020	2.1.20	
	Importance Rating	4.6		

Conduct of Operations: Ability to interpret and execute procedure steps. (Inadvertent Cont. Isolation)

Proposed Question: SRO # 84

The plant is at rated power. Conditions are as follows:

- An inadvertent isolation signal has caused the Outboard CCP Containment Isolation valves to the drywell cooling system to isolate
- The isolation signal CANNOT be reset
- Based on the nature of the malfunction, the CRS has declared the Outboard CCP Containment Isolation valves INOPERABLE per TS 3.6.1.3

IAW with N2-SOP-60, Loss of Drywell Cooling....

(1) Which Override Switch(es) is/are required to be placed in OVERRIDE to re-open the Outboard CCP valves to the drywell

AND

(2) How long can CCP remain aligned to the drywell without commencing a plant shutdown and still be in compliance with Technical Specifications section 3.6.1.3?

A. (1) Only the DRYWELL UNIT COOLER WTR DIV I LOCA OVERRIDE switch.
(2) 16 hrs

B. (1) Only the DRYWELL UNIT COOLER WTR DIV I LOCA OVERRIDE switch.
(2) 84 hrs

C. (1) BOTH the DRYWELL UNIT COOLER WTR DIV I LOCA OVERRIDE and the UNIT COOLER FANS GR1 LOCA OVERRIDE switches.
(2) 16 hrs

D. (1) BOTH the DRYWELL UNIT COOLER WTR DIV I LOCA OVERRIDE and the UNIT COOLER FANS GR1 LOCA OVERRIDE switches.
(2) 84 hours

Proposed Answer: A

Explanation (Optional):

A. Correct - Only the DRYWELL UNIT COOLER WTR DIV I LOCA OVERRIDE is required. TS 3.6.1.3 Action A states that for "One or more penetration flow paths with one PCIV inoperable except due to leakage not within limit" then the required action is to isolate the path within 4 hours. With the Div 1 switch in the override position, the outboard isolation valves will not close. Action F states that if the above required action cannot be completed within the allotted time then the plant must be in Mode 3 within 12 hours. Since the plant could be in mode 3 by inserting a manual scram, the CCP valves could remain open for 16 hours.

B. Incorrect - The plant shutdown must commence no later then16 hours from the time switches are placed in override. Plausible in that this would be true if the penetration was associated with a "Closed system". CCP is not a Closed system.

C. Incorrect - Use of the UNIT COOLER FANS GR1 LOCA OVERRIDE switch is not required. This switch overrides the trip signal to the cooler fans if the CCP isolation valves are not open.

D. Incorrect - Use of the UNIT COOLER FANS GR1 LOCA OVERRIDE switch is not required. This switch overrides the trip signal to the cooler fans if the CCP isolation valves are not open.

Technical Reference(s): N2-SOP-60, Loss of Drywell Cooling (Attach if not previously provided)

TS Section 3.6.1.3

Proposed References to be provided to applicants during examination: TS section 3.6.1.3, no bases

Learning Objective: LP N2101223004C01, Drywell Cooling, RBO-11, System Loss and Component Level Malfunction (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 2

Facility operating limitations in the technical specifications and their bases.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	295009 2.1.23	
	Importance Rating	4.4	

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation. (Low Reactor Water Level)
Proposed Question: SRO # 85

The plant is shutdown following a small LOCA. Conditions are as follows:

- No injection sources are currently available
- N2-EOP-C3, Steam Cooling is being executed
- RPV level is -35 inches (actual) and lowering slowly

Then five minutes later......

- A Control Rod Drive pump is restored and is now injecting
- RPV level is -42 inches (actual) and continuing to lower

Which one of the following is required?

A. Exit EOP-C3 and enter EOP-C2 RPV Blowdown without delay.

B. Remain in EOP-C3 and enter EOP-C2 RPV Blowdown without delay.

C. Remain in EOP-C3 and continue efforts to align additional injection sources. If RPV level lowers to -58 inches, exit EOP-C3 and enter EOP-C2, RPV Blowdown without delay.

D. Exit EOP-C3 and re-enter EOP-RPV, RPV Control. Continue efforts to align additional injection sources and if RPV level cannot be restored and maintained above -58 inches, enter EOP-C2, RPV Blowdown without delay.

Proposed Answer: A

Explanation (Optional):

A. Correct - Per the 2nd override in EOP-C3, an RPV blow down must be performed. With an injection source injecting, one of the assumptions for steam cooling has been invalidated and adequate core cooling cannot be assured.

B. Incorrect - EOP-C3 must be exited.

C. Incorrect - EOP-C3 must be exited and EOP-C2 executed. Assumptions used for steam cooling without injection have been invalidated and adequate core cooling cannot be assured.

D. Incorrect - EOP-C2 must be executed without delay. Assumptions used for steam cooling without injection have been invalidated and adequate core cooling cannot be assured.

Technical Reference(s): EOP-C3, Steam Cooling (Attach if not previously provided)

EOP bases document, page 10-5

Proposed References to be provided to applicants during examination: None

Learning Objective: LP, N2-EOP-C3, STEAM COOLING, EO-2, Operational Actions and Sequence (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	209001	A2.04
	Importance Rating		

Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: D.C. failures

Proposed Question: SRO Question # 86

The plant is shutdown following a LOCA. Conditions are as follows:

- Low Pressure Core Spray (CSL) is the only system injecting.
- RPV water level is 175 inches and rising
- A loss of 125 VDC switchgear 2BYS*SWG002A occurs

Which one of the following is the impact on CSL and what actions are required?

A. (1) CSL pump breaker trips.
   (2) In accordance with N2-EOP-RPV, RPV Control; inhibit ADS and lineup alternate injection systems as needed to maintain RPV water level greater than -14".

B. (1) CSL pump breaker trips.
   (2) Direct an operator to manually close the CSL pump breaker using N2-ELU-01, Walkdown Order Electrical Lineups and Breaker Operations and re-establish CSL injection.

C. (1) CSL continues to operate.
   (2) In accordance with N2-EOP-RPV, RPV Control; maintain injection by operating the CSL system as needed to maintain RPV water level between 159.3" and 202.3".

D. (1) CSL continues to operate.
   (2) In accordance with N2-SOP-04, Loss Of DC Power, immediately de-energize 2ENS-SWG-101. In accordance with N2-EOP-RPV, RPV Control; inhibit ADS and lineup alternate injection systems as needed to maintain RPV water level greater than -14".

Proposed Answer: C

Explanation (Optional):

A. Incorrect – The CSL pump breaker will remain closed. CSL injection may continue and RPV water level can be maintained and controlled above -14" therefore there is no requirement to inhibit ADS and lineup alternate injection systems.

B. Incorrect - The CSL pump breaker will remain closed.

C. Correct – The loss of DC power to the CSL system will remove power from 4 KV breaker, this will remove protective tripping and remote breaker operation. The breaker will remain closed and CSL will continue to inject. IAW N2-EOP-RPV and N2-OP-32 RPV water level can be controlled by opening and closing CSL*MOV104 locally.

D. Incorrect – Plausible in that the switchgear is in service without any bus protection. However, per SOP-04 discussion item 5.2, it is recommended to NOT shed AC loads on a loss of divisional DC power. A probability assessment has been performed and the results support this recommendation. The recovery of DC power should be the highest priority for the operators. IF the loss of divisional DC power is for an extended period of time (>12 hrs), THEN, it may be desirable to shed the AC loads AND de-energize the associated emergency switchgear. Additionally Although OP-32 directs stopping the pump when injection is not required, the pump may only be manually started at the breaker once because with a loss of DC power the charging motor cannot recharge the closing springs.

Technical Reference(s): N2-EOP-RPV
N2-SOP-04, Page 9, 13 (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	261000	A2.05
	Importance Rating		3.1

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

Proposed Question: SRO Question # 87

The plant is operating at 100% power. Conditions are as follows:

- GTS Train A is in a normal standby condition
- GTS Train B is running for routine surveillance

Then 2GTS*FN1B GTS B FAN trips due to a blown fuse in the control circuit.

While performing standby checks on GTS Train A, a PO reports that 2GTS*TK1A GTS TRAIN A AIR ACCUMULATOR is reading 300 psig

Which one of the following describes (1) the capability of the GTS system to meet its designed Technical Specification function and (2) what Technical Specification action is required?

(1) The GTS system is...

A. (1) capable of meeting its design Technical Specification function.
   (2) Restore GTS Train B to operable status within 7 days.

B. (1) capable of meeting its design Technical Specification function.
   (2) Be in Mode 3 within 13 hours and Mode 4 within 37 hours.

C. (1) NOT capable of meeting its design Technical Specification function.
   (2) Be in Mode 3 within 12 hours and Mode 4 within 36 hours.

D. (1) NOT capable of meeting its design Technical Specification function.
   (2) Be in Mode 3 within 13 hours and Mode 4 within 37 hours.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Since TK1A is reading <330 psig, per N2-OP-61B, GTS train A is considered inoperable. Since GTS B Fan tripped, then GTS Train B is also considered inoperable.

With both trains inoperable, TS Bases 3.6.4.3, Condition D.1 states that the GTS system is not capable of supporting its designed Tech Spec function and TS 3.0.3 must be entered. Plausible in that if the candidate does not know that <330 psig will inop the GTS train, then this answer could be considered correct.

B. Incorrect. Plausible in that the candidate may know both trains are inoperable, but may think that since GTS A is still running that it is capable of performing its Tech Spec Function.

C. Incorrect. Although it is not capable of performing its Tech Spec function, the 12 hour mode 3 and 36 hour mode 4 requirement are the tech spec actions for one train of GTS inoperable, not two trains.

D. Correct. Since TK1A is reading <330 psig, per N2-OP-61B, GTS train A is considered inoperable. Since GTS B Fan tripped, then GTS Train B is also considered inoperable. With both trains inoperable, TS Bases 3.6.4.3, Condition D.1 states that the GTS system is not capable of supporting its designed Tech Spec function and TS 3.0.3 must be entered which requires Mode 3 within 13 hours and Mode 4 within 37 hours.

Technical Reference(s): N2-OP-61B, Page 30
T.S. 3.6.4.3 and Bases
T.S. 3.0.3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: T.S. 3.6.4.3 no Bases.

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 2

Facility operating limitations in the technical specifications and their bases.

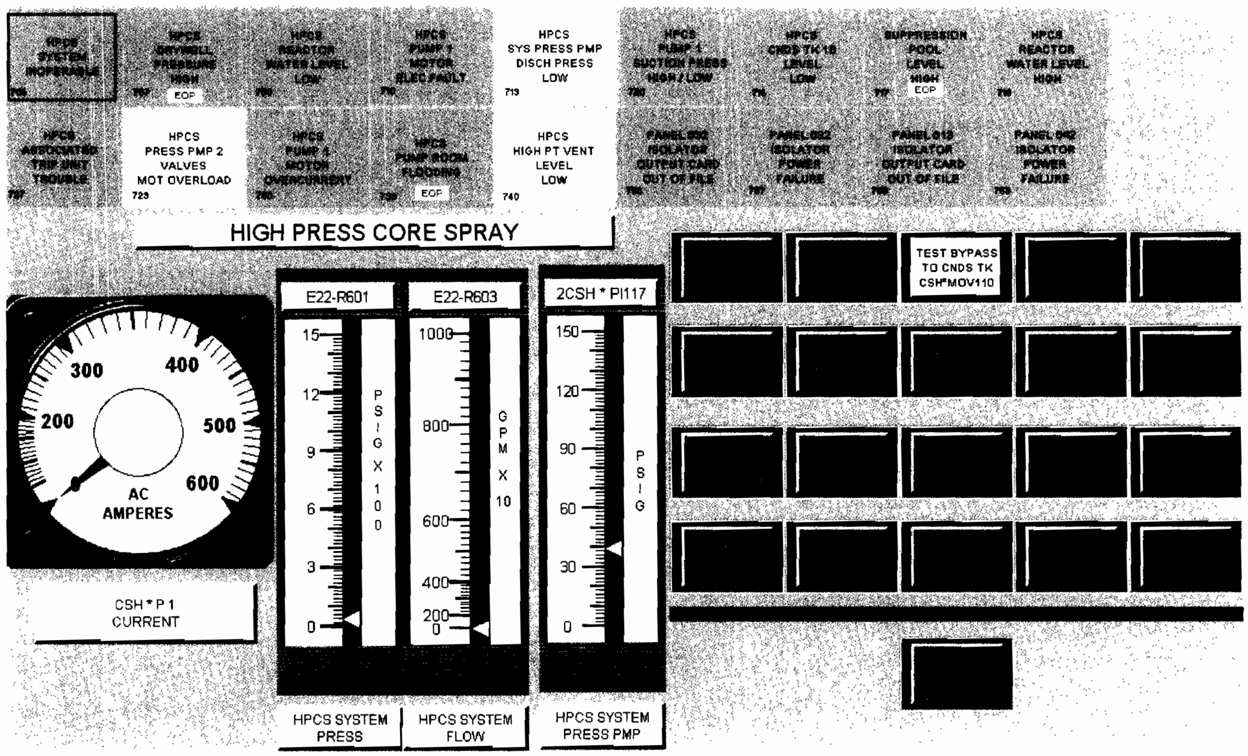
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	209002	2.1.7
	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. (HPCS)

Proposed Question: SRO Question # 88

The plant is at rated power. Indications for HPCS are as follows:



Which one of the following is the status of HPCS and what actions should the SRO direct?

A. HPCS is INOPERABLE because 2CSH*MOV110 has lost control power. Dispatch an operator to locally verify shut 2CSH*MOV110.

B. HPCS is INOPERABLE. Place HPCS in Pull to Lock per ARP 601740 and perform actions within N2-OP-33 for CSH Operation with WTR LEG PMP2 Out of Service.

C. HPCS is INOPERABLE but AVAILABLE. Leave 2CSH*P1 in NORMAL AFTER STOP and perform actions within N2-OP-33 for CSH Operation with WTR LEG PMP2 Out of Service.

D. HPCS is OPERABLE because CST B Tank level is above the low level alarm setpoint. Perform actions within N2-OP-33 for CSH Operation with WTR LEG PMP2 Out of Service.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. During power operations, the 2CHS*MOV110 breaker is normally open for Appendix R purposes. The 2CHS*MOV110 status light is normally lit during power operations.

B. Correct. Per ARP 601740, the required action is to place the pump in PTL. Per N2-OP-33, the HPCS system is considered inoperable.

C. Incorrect. Per ARP 601740, the HPCS pump must be placed in Pull to Lock.

D. Incorrect. HPCS is not operable.

Technical Reference(s): N2-ARP-601500, 601740
N2-OP-33, Section H.10.0 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: N2-209002-RBO-14 (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

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

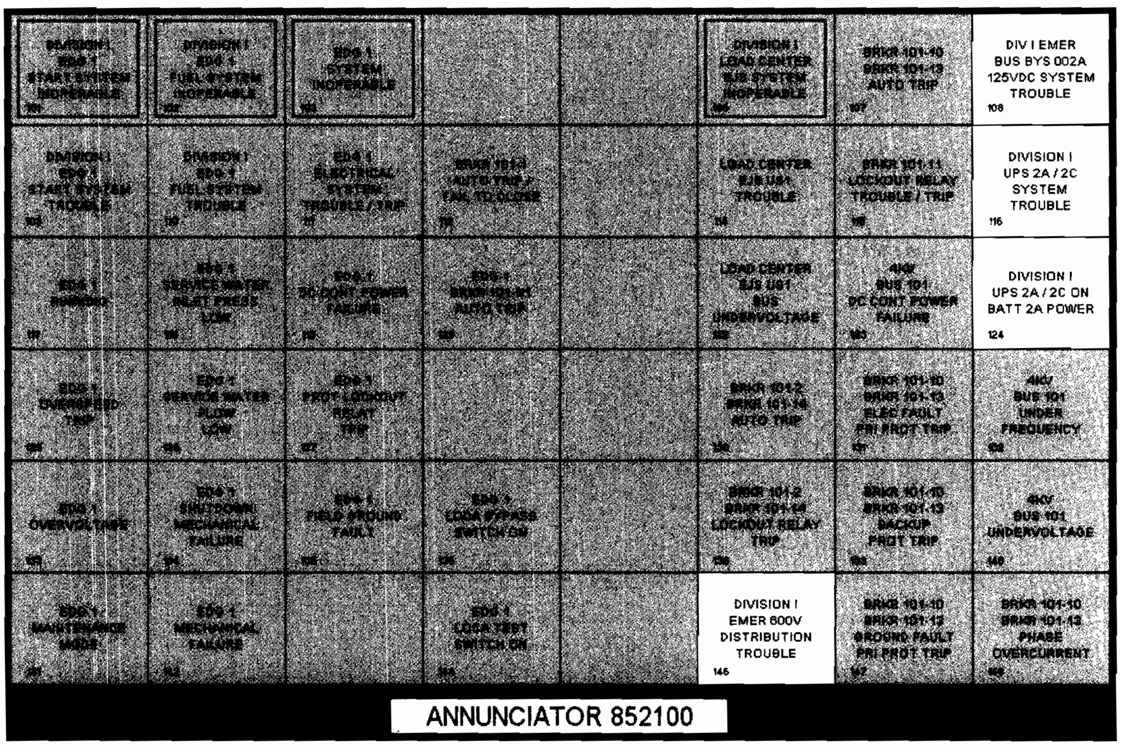
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	262001	2.2.44
	Importance Rating		4.4

Equipment Control: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (AC Electrical Distribution)

Proposed Question: SRO Question # 89

The plant is operating at rated power when the following indications are observed on 2CEC*PNL852:



Which one of the following could cause these indications and what actions if any are required per T.S. 3.8.7?

Loss of the electrical panel which supplies...

A. normal AC power to the Division I UPS. Be in Mode 3 within 36 hours.

B. maintenance AC power to the Division I UPS. Be in Mode 3 within 36 hours.

C. normal AC power to the Division I UPS. No Technical Specification actions required.

D. maintenance AC power to the Division I UPS. No Technical Specification actions required.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Although a loss of normal AC could cause these indications, per the TS bases, the loss of the normal AC power supply does not require the UPS to be declared inoperable.

B. Incorrect. A loss of maintenance AC would not cause the UPS to be on battery power, (i.e. 852124 in alarm).

C. Correct. The loss of normal AC (2EJS*PNL100A), would cause a loss of AC power to the Battery charger resulting in annunciator 852108 , (DC bus voltage <131 VDC). Additionally, with the loss of normal AC to UPS 2A/2C, 852116 alarms and the UPS goes to the battery supply which causes 852124 to alarm. Since the UPS is still operating on battery power, and no indications are given that there is anything else wrong with the battery (other than not being on the charger), the UPS is still operable per the TS bases and so no Technical Specification actions are required.

D. Incorrect. A loss of maintenance AC would not cause the UPS to be on battery power, (i.e. 852124 in alarm)

Technical Reference(s): ARP 852108, 116, 124, 146
TS 3.8.7 Bases (Attach if not previously provided)

Proposed References to be provided to applicants during examination: TS 3.8.7, no bases.

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	2

Facility operating limitations in the technical specifications and their bases.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	239002	2.4.9
	Importance Rating		4.2

Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. (SRVs)

Proposed Question: SRO Question # 90

The plant is shutdown with an RPV Blowdown in progress. Conditions are as follows:

- Drywell pneumatics have been restored.
- Seven ADS valves are open
- Reactor pressure is 180 psig and lowering
- Annunciator 601515 ADS AIR HEADER B TROUBLE, is in alarm
- Both ADS Header B high and low flow supply valves are open
- ADS Header B pressure is 60 psig and lowering
- All ADS accumulator pressures associated with ADS Header B indicate approximately 170 psig and slowly lowering

What is the status of the ADS valves associated with ADS AIR HEADER B and what action should the SRO direct to mitigate the consequences of these indications?

The ADS valves associated with ADS AIR HEADER B are....

A. open but will eventually close as accumulators depressurize. If less than 6 SRVs are open, maintain RPV pressure less than 40 psi above Suppression Chamber pressure, in accordance with N2-EOP-C2.

B. cycling between open and close due to low pneumatic pressure. If less than 6 SRVs are open, maintain RPV pressure less than 40 psi above Suppression Chamber pressure, in accordance with N2-EOP-C2.

C. open but will eventually close as accumulators depressurize. Direct that ADS Header B and ADS Receiver 2IAS*TK 5 be re-pressurized by aligning instrument air, in accordance with ARP 601515.

D. cycling between open and close due to low pneumatic pressure. Direct that ADS Header B and ADS Receiver 2IAS*TK 5 be re-pressurized by aligning instrument air, in accordance with ARP 601515.

Proposed Answer: A

Explanation (Optional):

A. Correct: ADS valves are being held open by their accumulators, as pressure lowers the valves will close and cannot be opened. The pneumatic symptoms provided are indicative of a pneumatic supply line break in the drywell. ADS Air Header B supplies air to ADS valve accumulator tanks TK35, TK36, TK37 AND TK38. The three other ADS valve accumulators are still operable. Additionally the non ADS valves are un-effected. IAW N2-EOP-C2, RPV Blowdown with less than 6 SRVs open, maintain RPV pressure less than 40 psig above suppression chamber pressure

B. Incorrect: ADS valves are being held open by their accumulators

C. Incorrect: Aligning IAS is not allowed per procedure.

D. Incorrect: ADS valves are being held open by their accumulators. Aligning the IAS system is not allowed per procedure.

Technical Reference(s): N2-ARP-601500, 601515, N2-EOP-C2 N2-OP-34, Page 35 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: LP #2101-218000C01, RBO-5 (As available)

Question Source: Bank # WTSI 11863

Modified Bank # (Note changes or attach parent)

New

Question History: Last NRC Exam: 2010 SRO #87

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal,

abnormal, and emergency situations.
Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			2
	Group #			2
	K/A #	201006	A2.04	
	Importance Rating			3.3

Ability to (a) predict the impacts of the following on the ROD WORTH MINIMIZER SYSTEM (RWH) (PLANT SPECIFIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck rod: P-Spec(Not-BWR6)

Proposed Question: SRO Question # 91

The plant is starting up with the following conditions:

- Reactor power is 15% with the mode switch in RUN
- The control rod sequence directs control rod 18-31 to be withdrawn to position 48
- Control rod 18-31 is stuck at position 42 and CANNOT be moved
- There are no other control rod abnormalities

Given that rod 18-31 is to be left at position 42 and the startup is to be continued, which one of the following is correct regarding:

(1) Any impact on the Rod Worth Minimizer

AND

(2) Any required Technical Specification actions?

A. (1) Rod 18-31 will be identified as an Insert Error when withdraw of the next step is commenced. Since the RWM allows up to two insert errors the RWM will allow the startup to continue.
(2) The rod must be disarmed within 2 hours and shutdown margin verified.

B. (1) Rod 18-31 will be identified as an Insert Error when withdraw of the next step is commenced. Since the RWM allows up to two insert errors the RWM will allow the startup to continue.
(2) The rod must be declared inoperable within 2 hours and shutdown margin verified.

C. (1) The RWM will apply insert and withdraw blocks as soon as a rod in the next step is selected. Unless the rod is bypassed in the RWM or the RWM is bypassed, the startup cannot continue.
(2) The rod must be declared inoperable within two hours and shutdown margin verified. If the RWM is bypassed, a second operator must be stationed to verify compliance with the withdraw sequence.

D. (1) The RWM will apply insert and withdraw blocks as soon as a rod in the next step is selected. Unless the rod is bypassed in the RWM or the RWM is bypassed the startup cannot continue.
(2) The rod must be disarmed within 2 hours and shutdown margin verified. Tech Specs does not require a second operator be stationed if the RWM is bypassed because the RWM does not need to be operable.

Proposed Answer: D

Explanation (Optional):

A. Incorrect: Insert and withdraw blocks will be applied when withdraw of the next step is commenced, as the RWM will not allow an operator to make an error. Plausible in that the RWM will allow operation with two insert errors.

B. Incorrect: Insert and withdraw blocks will be applied when withdraw of the next step is commenced, as the RWM will not allow an operator to make an error. Plausible in that the RWM will allow operation with two insert errors. In addition the rod must be disarmed within 2 hours.

C. Incorrect: It is not necessary to station a second operator if the RWM is bypassed because more than 12 rods are withdrawn (TS 3.3.2.1 Condition C). At 4% power, many more than 12 rods have been withdrawn.

D. Correct: Insert and withdraw blocks will be applied when withdraw of the next step is commenced because the rod will be identified as in insert error. Additionally TS 3.1.3, condition A requires that the rod be disarmed within 2 hours an SDM verified. It also requires separation criteria be verified but there are no other rod abnormalities as stated in the stem. Because power is >10%, the RWM does not need to be operable per TS 3.1.6.

Technical Reference(s): T.S. 3.1.3
T.S. 3.1.6
N2-OP-95A, pg 40. (Attach if not previously provided)

Proposed References to be provided to applicants during examination: T.S. 3.1.3

Learning Objective: LP N2101201002C01, RMCS, RBO-11, System Loss and Component Level Malfunction (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	6

Procedures and limitations involved in initial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	202001	2.4.6
	Importance Rating		4.7

Emergency Procedures / Plan: Knowledge of EOP mitigation strategies. (Recirculation)

Proposed Question: SRO Question # 92

N2-EOP-C5, Failure to Scram is being executed. Plant conditions are as follows:

- Reactor Power is 26%
- Reactor Level is 180 inches
- Recirc Pumps are running in Fast Speed

Per GAI-OPS-20 Transient Mitigation Guidelines, which one of the following is correct regarding the sequencing of actions involving operation of the Recirculation System and the reason for it?

The SRO should prioritize....

A. reducing Recirc to minimum over lowering RPV level below 100 inches to prevent Level 8 trips.

B. lowering RPV level below 100 inches over reducing Recirc to minimum to prevent Level 8 trips.

C. reducing Recirc to minimum over lowering RPV level below 100 inches to increase margin to HCTL.

D. lowering RPV level below 100 inches over reducing Recirc to minimum to increase margin to HCTL.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Plausible, because if power were <4%, the Recirc system would be reduced to minimum and level would not be lowered.

B. Correct. Per GAI-OPS-20, when the SRO is faced with either lowering RPV level or reducing Recirc to minimum, they should choose to lower RPV level because of the potential for level transients tripping the turbine or feed pumps (L8).

C. Incorrect. Increasing the margin to HCTL is not the reason for prioritizing lowering level over Recirc. Plausible in that if heat were being added to the suppression pool, lowering level is a quicker method of lowering power than reducing recirc to minimum. This would reduce heat input into the suppression pool and increase your margin to HCTL.

D. Incorrect. Increasing the margin to HCTL is not the reason for prioritizing lowering level over Recirc. Plausible in that if heat were being added to the suppression pool, lowering level is a quicker method of lowering power than reducing recirc to minimum. This would reduce heat input into the suppression pool and increase your margin to HCTL.

Technical Reference(s): GAI-OPS-20, Sects 2.3.1.3 (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 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	290002	2.4.30
	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 the state, the NRC, or the transmission system operator. (Reactor Vessel Internals)

Proposed Question: SRO Question # 93

The plant is operating at rated power when a rupture in the Reactor Pressure Vessel occurs. Conditions are as follows:

- Due to a failed Jet Pump, adequate core cooling cannot be established
- Based on plant conditions, the Shift Manager has assumed the role of Emergency Director and declared a SITE AREA EMERGENCY (SAE) based on RPV level.

Which one of the following (1) is the latest time the County and State can be informed of the emergency action level and (2) when must the NRC be informed of the emergency action level?

A. (1) Within 15 minutes from the time of the SAE declaration.
   (2) As soon as possible, not to exceed 15 minutes after the SAE declaration.

B. (1) Within 15 minutes from the time the Emergency Director approves the Part 1 Notification Fact Sheet.
   (2) As soon as possible, not to exceed 15 minutes after the SAE declaration.

C. (1) Within 15 minutes from the time the Emergency Director approves the Part 1 Notification Fact Sheet.
   (2) As soon as possible, not to exceed 1 hour after the SAE declaration.

D. (1) Within 15 minutes from the time of the SAE declaration.
   (2) As soon as possible, not to exceed 1 hour after the SAE declaration.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Although the county and state must be informed within 15 minutes from the time of the SAE declaration, you have an hour to inform the NRC, (however it must be done as soon as possible).

B. Incorrect. Although the Part 1 Notification is approved by the Emergency Director, the notification to the state and county is required within 15 minutes of the declaration of the SAE.

C. Incorrect. Although the Part 1 Notification is approved by the Emergency Director, the notification to the state and county is required within 15 minutes of the declaration of the SAE.

D. Correct. Per EPIP-EPP-18, Attachment 1, the ED has 15 minutes from the time of declaration of the SAE to inform the state and county and up to one hour to inform the NRC, (however this should be done as soon as the state and county notifications are complete.)

Technical Reference(s): EPIP-EPP-18, Attachment 1. (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 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		1
	K/A #	G1	2.1.13
	Importance Rating		3.2

Conduct of Operations: Knowledge of facility requirements for controlling vital / controlled access.

Proposed Question: SRO Question # 94

The plant is operating at 100% power with the following:

- A credible insider threat has resulted in activation of the "Two Person Rule" in accordance with EPIP-EPP-10, Security Contingency Event
- The CRS determines access to the RB is needed by a PO to operate a valve.
- There are no other operators currently available.
- The PO requests an exception to the “Two Person Rule”

Which one of the following describes the correct response to this request in accordance with EPIP-EPP-10?

An Exception to the “Two Person Rule”...

A. may be approved by the Security Shift Supervisor.

B. may be approved by the Control Room Supervisor.

C. may NOT be approved, but a Security Officer may accompany the Operator.

D. may NOT be approved and the PO must wait until another operator becomes available.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. There is no provision in EPIP-EPP-10 for an exception to the two person rule.

B. Incorrect. There is no provision in EPIP-EPP-10 for an exception to the two person rule.

C. Correct. The two man rule requires: 1) Equal task qualification levels are not necessary, 2) Partner must remain in line of sight, 3) Partner must have access to the vital area. The security guard meets the requirements for the two man rule.

D. Incorrect. The requirement for the two man rule are only that another person qualified to be in the vital area is within line of site. Equal qualifications are not required.

Technical Reference(s):	EPIP-EPP-10, 5		(Attach if not previously provided)
Proposed References to be provided to applicants during examination:			None
Learning Objective:	O3-OPS-006-350-3-31, EO-1.3		(As available)
Question Source:	Bank #		
	Modified Bank #	Based on 2010 NMP 1 Question	(Note changes or attach parent)
	New		
Question History:	Last NRC Exam:	2010	NMP 1
Question Cognitive Level:	Memory or Fundamental Knowledge	X	
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		
	55.43	5	

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	G2	2.2.22
	Importance Rating		4.7

Equipment Control: Knowledge of limiting conditions for operations and safety limits.

Proposed Question: SRO Question # 95

The plant is operating at 80%. Conditions are as follows:

- APRM Channel 1 is bypassed.
- APRM Channel 3 has the following operable LPRM inputs:
  - A Level LPRMs 5
  - B Level LPRMs 5
  - C Level LPRMs 4
  - D Level LPRMs 6

Annunciator 603211, LPRM DOWNSCALE, alarms.

The LPRM Display indicates a C Level LPRM which provides input to APRM 3 is DOWNSCALE. The Reactor Operator recommends bypassing the failed LPRM.

Which one of the following describes (1) the affect of BYPASSING the failed LPRM on APRM Channel 3, and (2) what action is required?

When the failed LPRM is BYPASSED, APRM Channel 3 will be INOPERABLE because there are ONLY ...

A. (1) 19 LPRMs providing input.
(2) APRM Channel 3 must be placed in the TRIPPED condition.

B. (1) 3 LPRMs providing input at the C Level.
(2) APRM Channel 3 must be placed in the TRIPPED condition.

C. (1) 19 LPRMs providing input.
(2) No actions are required; Technical Specifications are satisfied by the TWO remaining APRMs.

D. (1) 3 LPRMs providing input at the C Level.
(2) No actions are required; Technical Specifications are satisfied by the TWO remaining APRMs.

Proposed Answer: A

Explanation (Optional):

A. Correct - With 19 total LPRMs providing input, APRM Channel 3 is made INOPERABLE. The required Number of APRM Channels is three and with APRM Channel 1 inoperative the second channel (Channel 3) becoming inoperable requires placing a channel in TRIP

B. Incorrect – APRM must have 20 LPRM inputs to be operable, this identifies potential misconception regarding MINIMUM REQUIRED Channels and number of channels per level.

C. Incorrect – The required Number of APRM Channels is three and with APRM Channel 1 inoperative the second channel (Channel 3) becoming inoperable requires placing a channel in TRIP

D. Incorrect – APRM must have 20 LPRM inputs to be operable, this identifies potential misconception regarding MINIMUM REQUIRED Channels and number of channels per level. The required Number of APRM Channels is three and with APRM Channel 1 inoperative the second channel (Channel 3) becoming inoperable requires placing a channel in TRIP

Technical Reference(s): LCO 3.3.1.1
N2-OP-92, P&L 9.0 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: (As available)

Question Source: Bank # WTSI 1534

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

Facility operating limitations in the technical specifications and their bases.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			3
	Group #			3
	K/A #	G3	2.3.11	
	Importance Rating			4.3

Radiation Control: Ability to control radiation releases.

Proposed Question: SRO Question # 96

The plant was at 100% power when a large break LOCA occurred. Conditions are as follows:

- Fuel damage has occurred.
- The RPV was blown down due to RPV level.
- The SM has assumed the role of Emergency Director (ED) and declared an ALERT based on containment pressure.

Which one of the following actions can the SRO and/or ED/SM perform that would limit radiological dose to the plant and/or public?

A. Direct an Exclusion Area Evacuation per EPIP-EPP-05C

B. Provide Protective Action Recommendations (PARs) to the county per EPIP-EPP-08.

C. Direct an RO to inject boron into the RPV using the Standby Liquid Control System per N2-OP-36A.

D. Direct an RO to verify both CONTROL ROOM AC BOOSTER FANS are running per N2-EOP-6, Attachment 1.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. An Exclusion Area Evacuation is not declared for an Alert, it would be initiated for a Site Area Emergency or General Emergency.

B. Incorrect. PARs cannot be issued because a General Emergency has not been declared.

C. Correct. Per N2-OP-36A, injection of boron after a LOCA with fuel damage can limit the radiological dose by maintaining the suppression pool Ph above 7. Additionally, N2-EOP-RPV step L-16 requires that boron be injected.

D. Incorrect. N2-EOP-6 requires that only 1 control room booster fan be running to limit the dose of the control room crew.

Technical Reference(s): N2-OP-36A, Discussion Section (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 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			3
	Group #			4
	K/A #	G4	2.4.1	
	Importance Rating			4.8

Emergency Procedures / Plan: Knowledge of EOP entry conditions and immediate action steps.

Proposed Question: SRO Question # 97

The reactor is shutdown following an explosion inside the protected area. Conditions are as follows:

- Suppression pool water level is 200 feet and stable
- Suppression pool temperature is 105°F and slowly rising
- RPV Water level is downscale on the fuel zone
- RPV Pressure is 1000 psig and slowly lowering
- Reactor power is unknown
- The SRO has just entered N2-EOP-RPV and N2-EOP-PC

Which one of the following actions is required?

Note: N2-EOP-C4 is RPV FLOODING, and N2-EOP-C5 is FAILURE TO SCRAM

Exit N2-EOP-RPV and immediately enter...

A. N2-EOP-C4. After entry into N2-EOP-C4, open 7 ADS valves.

B. N2-EOP-C4. After entry into N2-EOP-C4, terminate and prevent all injection except; Boron, CRD, and RCIC.

C. N2-EOP-C5. After entry into N2-EOP-C5, immediately exit the Pressure and Level legs of N2-EOP-C5, enter N2-EOP-C4, and open 7 ADS valves.

D. N2-EOP-C5. After entry into N2-EOP-C5, place HPCS in pull-to-lock and inhibit ADS. Exit N2-EOP-C5 Pressure and Level legs, enter N2-EOP-C4, and terminate and prevent all injection except; Boron, CRD, and RCIC.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Entry into N2-EOP-C5 is required first before entry into N2-EOP-C4. Plausible if the candidate does not know that the override for entry into C5 is before the

override for C4 and the action once in C4 is to terminate and prevent, not open 7 ADS valves.

B. Incorrect. Entry into N2-EOP-C5 is required first before entry into N2-EOP-C4. Plausible if the candidate does not know that the override for entry into C5 is before the override for C4.

C. Incorrect. The requirement to place HPCS in PTL and inhibit ADS comes before the override to exit C5 and enter C4. Additionally, once in C4, the operators must terminate and prevent before opening 7 ADS valves.

D. Correct. The override to exit N2-EOP-RPV and enter C4 is found in the level leg of EOP-RPV. Because reactor power is unknown, the SRO must exit EOP-RPV and enter C5 before the level leg of EOP-RPV is executed. Once in C5, the actions to place HPCS in PTL and inhibit ADS come before the override to exit C5 and enter C4. Once C4 is entered, the SRO must terminate and prevent all injection except CRD, RCIC, and Boron before opening 7 ADS valves.

Technical Reference(s): N2-EOP-RPV, C4, C5 (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO		SRO
	Tier #			3
	Group #			4
	K/A #	G4	2.4.9	
	Importance Rating			4.2

Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

Proposed Question: SRO Question # 98

The plant is in Mode 4. Conditions are as follows:

- Reserve Station Transformer A is being powered by Line 5
- Reserve Station Transformer B is being powered by Line 6
- RPV Level is 184 inches
- Recirc Pump B is in slow speed
- Recirc Pump A is tagged out for maintenance.
- RHS A and LPCS are tagged out for maintenance
- RHS B is operating in shutdown cooling mode

Then a loss of Line 6 occurs. Division II EDG immediately trips on overspeed.

Which one of the following actions are required?

A. Do not attempt to restart the Division II EDG. Lineup for Alternate shutdown cooling, Preferred Lineup per N2-SOP-31, Loss of Shutdown Cooling

B. Do not attempt to restart the Division II EDG. Within one hour of the loss of Line 6, raise RPV level to 227 to 243 inches per N2-SOP-31, Loss of Shutdown Cooling.

C. Reset the overspeed device and attempt to restart the Division II EDG per N2-SOP-03, Loss of AC Power. If the Division II EDG starts and powers its bus, then restart RHS B in shutdown cooling mode per N2-SOP-31, Loss of Shutdown Cooling.

D. Reset the overspeed device and attempt to restart the Division II EDG per N2-SOP-03, Loss of AC Power. If the Division II EDG fails to start, then within one hour of the loss of Line 6, raise RPV level to 227 to 243 inches per N2-SOP-31, Loss of Shutdown Cooling.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Since Line 6 is deenergized and Div II EDG is not powering its bus, RHS B is not available. The question stem gives RHS A out of service. Per N2-SOP-31, Attachment 1, RHS A or B are needed in order to establish alternate shutdown cooling.

B. Correct. Since the EDG tripped on overspeed, it cannot be started per N2-SOP-03. On the loss of line 6, Recirc Pump B trips. With a loss of shutdown cooling and RPV level <227 inches, then within one hour, the operators must raise level to between 227 and 243 inches per N2-SOP-31.

C. Incorrect. N2-SOP-03 does not allow restarting an EDG with an overspeed condition in.

D. Incorrect. N2-SOP-03 does not allow restarting an EDG with an overspeed condition in.

Technical Reference(s): N2-SOP-31 N2-SOP-03 (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

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41

55.43 5

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Proposed References to be provided to applicants during examination:			None
Learning Objective:			(As available)
Question Source:	Bank #	2009 NRC #94	
	Modified Bank #		(Note changes or attach parent)
	New		
Question History:		Last NRC Exam:	2009 NRC #94
Question Cognitive Level:	Memory or Fundamental Knowledge		X
	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		
	55.43	5	

Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		
	Group #		
	K/A #	G3	2.3.12
	Importance Rating		3.7

Radiation Control: Knowledge of Radiological Safety Principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Proposed Question: SRO Question # 100

The plant is in Mode 5 with a core shuffle about to begin. Per N2-FHP-13.3, Core Shuffle, which one of the following describes (1) the type of Radiation Work Permit (RWP) required for conducting the Core Shuffle and (2) the requirements for personnel access to the Drywell during the Core Shuffle?

A. (1) A Standing RWP is required.
   (2) Drywell access is NOT allowed during a Core Shuffle.

B. (1) A Standing RWP is required.
   (2) Drywell access IS allowed during a Core Shuffle, provided personnel do not go above elevation 288 feet.

C. (1) A Specific RWP is required.
   (2) Drywell access is NOT allowed during a Core Shuffle.

D. (1) A Specific RWP is required.
   (2) Drywell access IS allowed during a Core Shuffle, provided personnel do not go above elevation 288 feet.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. A Specific RWP is required and Drywell access is allowed provided personnel do not go above elevation 288 feet.

B. Incorrect. A Specific RWP is required and Drywell access is allowed provided personnel do not go above elevation 288 feet

C. Incorrect. Drywell access is allowed provided personnel do not go above elevation 288 feet.

D. Correct. Per N2-FHP-13.3, P&L 4.4.2 and 4.4.3, a Specific RWP is required and Drywell access is allowed provided personnel do not go above elevation 288 feet.

Technical Reference(s): N2-FHP-13.3, Core Shuffle P&L 4.4.2 and 4.4.3 (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 7

Fuel handling facilities and procedures.

Comments: