

2019 NRC Written Examination

Question: RO #1

Given:

- The plant was operating at 65% rated power.

When:

- The "A" Reactor Recirculation Pump tripped.
- The crew enters HC.OP-AB.RPV-0003, "Recirculation System/Power Oscillations"

Current plant conditions:

- Reactor power is at 55% of rated thermal power.
- Core flow is determined to be 40% of rated flow.
- OPRMs are Operable.
- Final Feedwater Heating is NOT implemented.
- OPRM TRIP ENABLE (C3-F1) is in alarm.
- OPRM PRE-TRIP (C3-F2) is in alarm.

While completing the applicable actions of HC.OP-AB.RPV-0003; the OPRM PRE-TRIP (C3-F2) alarm will NOT clear.

(Assume the reason for the "A" Recirculation pump trip is known and the pump is available)

Which one of the following is the next action that must be taken by the operating crew to clear the OPRM PRE-TRIP (C3-F2) alarm IAW HC.OP-AB.RPV-0003, Recirculation System/Power Oscillations?

**[Reference attached]**

- A. Lock the Mode Switch in Shutdown.
- B. Rod insertion IAW Enhanced Stability Guidance.
- C. Increase the speed of "B" Reactor Recirculation Pump to increase core flow to between 45% and 50% or rated core flow.
- D. Restart "A" Reactor Recirculation Pump to increase core flow to greater than 51% or rated core flow.

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Question: RO #2

Given:

- The plant is at 100% rated power with all systems in a normal lineup.

Then:

- At 1330 the 'A' Emergency Diesel Generator is declared inoperable and tagged out for emergent work.
- At 1400 the surveillance, HC.OP-ST.ZZ-0001 "Power Distribution Lineup-Weekly", was completed satisfactorily to demonstrate the OPERABILITY of the remaining AC sources.
- At 1415 the 500 Kv Bus 10X lockout relay actuates and the 10X Bus is locked out and declared inoperable.

All other plant equipment is OPERABLE.

What is the NEXT required time by Technical Specifications to perform HC.OP-ST.ZZ-0001 "Power Distribution Lineup-Weekly" to demonstrate the OPERABILITY of the remaining AC sources?

- A. 1430
- B. 1445
- C. 1500
- D. 1515

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Question: RO #3

Given:

- The plant is at 100% rated power.

Then:

- A loss of 125 VDC occurs to the normal in-feed breaker for the 7.2 Kv Bus 10A110.

Which describes the effect of this loss, if any?

The breaker \_\_\_\_ (1) \_\_\_\_ trip on a bus lockout. The ability to open and/or close the breaker from the control room \_\_\_\_ (2) \_\_\_\_ remain functional.

- A. (1) will NOT ; (2) will NOT
- B. (1) will NOT ; (2) will
- C. (1) will STILL ; (2) will NOT
- D. (1) will STILL ; (2) will

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Question: RO #4

Given:

- The plant is operating at 100% rated power.

When:

- A Main Turbine trip occurs.

How will the Extraction Steam System be affected?

The Air Relay Dump Valves (ARDVs) will reposition to isolate \_\_\_\_\_.

- A. the Feedwater Heater Extraction Steam Isolation Valve to prevent water induction into the main turbine.
- B. the Feedwater Heater Bleeder Trip Valve (BTV) to prevent a main turbine overspeed.
- C. the Feedwater Heater Extraction Steam Isolation Valve to prevent a main turbine overspeed.
- D. the Feedwater Heater Bleeder Trip Valve (BTV) to prevent water induction into the main turbine.

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Question: RO #5

Following a reactor scram with reactor water level below +12.5 inches, the Setpoint Setdown Logic will \_\_\_\_\_.

- A. lower the DFCS Startup Level Controller setpoint to prevent vessel overfeed.
- B. lower total feed flow signal, to match actual steam flow to the turbine, which will now be 'zero'.
- C. lower the DFCS Master Level Controller setpoint to prevent a vessel overfeed.
- D. lower the total steam flow signal so feed flow will vary due to any deviation between actual and desired level only.

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Question: RO #6

Given:

- Smoke in the control room has caused the control room to be evacuated.
- All actions of HC.OP-AB.HVAC-0002, CONTROL ROOM ENVIRONMENT have been performed.
- RPV level is stable with RCIC injection.
- HPCI is no longer required for injection.

IAW HC.OP-AB.HVAC-0002, HPCI would be shutdown by opening the circuit breaker for HPCI RELAY VERT BD 10C620 at which one of the following 1E D.C. electrical distribution sources?

- A. 10D251
- B. 1AD417
- C. 10D261
- D. 1CD417

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Question: RO #7

Given:

- The plant is operating at 100% rated power.
- "A" and "B" Reactor Auxiliary Cooling System (RACS) pumps are in-service.

When:

- The RACS head tank begins to lower rapidly.

Which of the following identifies the potential cause of the low level in the RACS head tank?

- A. Tube rupture on the in-service RACS Heat Exchanger.
- B. Tube rupture in the Reactor Water Clean-Up (RWCU) Regenerative Heat Exchanger.
- C. Broken tube inside the Reactor Recirculation Pump Seal Cooler Heat Exchanger.
- D. Tube rupture in the Reactor Water Clean-Up (RWCU) Non-Regenerative Heat Exchanger.

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Question: RO #8

Given:

- The plant is operating at 70% rated power.

When:

- INSTRUMENT AIR HEADER A PRESSURE LO annunciator alarms.
- INSTRUMENT AIR HEADER B PRESSURE LO annunciator alarms.
- Main Condenser Vacuum is at 4.0 inches HgA and slowly degrading.
- 1-KAHV-7595 Service Air Supply Header Isolation Valve isolates.
- Instrument Air header pressure is still lowering.
- The PO reports that the air dryers have malfunctioned.
- Abnormal procedure AB.COMP-0001, Instrument and/or Service Air has been entered.
- Abnormal procedure AB.BOP-0006, Main Condenser Vacuum has been entered.

What is the current Instrument Air header pressure status and what action(s) is (are) required?

Instrument Air header pressure is \_\_\_\_\_ and \_\_\_\_\_.

- A.  $\leq 70$  psig; reduce Recirc pump speed to minimum, lock the mode switch in Shutdown.
- B.  $\leq 70$  psig; reduce Reactor power. A reactor scram is NOT required unless multiple control rod drifts begin to occur.
- C.  $> 70$  psig; reduce Recirc pump speed to minimum, lock the mode switch in Shutdown.
- D.  $> 70$  psig; reduce Reactor power. A reactor scram is NOT required unless multiple control rod drifts begin to occur.



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Question: RO #9

Given:

- The plant is in Operational Condition 4, preparing for plant startup.
- "B" RHR Loop is in Shutdown Cooling IAW HC.OP-SO.BC-0002, "Decay Heat Removal Operation".

Then:

- The Reactor Operator reports that shutdown cooling flow remains constant.
- RPV level is slowly rising and is currently at +85 inches.
- Reactor Head Vent temperature readings are rising.

Which of the following is the cause of the change in Reactor Head Vent Temperature?

- A. Closing Reactor Recirc Pump B Discharge valve BB-HV-F031B.
- B. Opening RHR Pump B Min Flow valve BC-HV-F007B
- C. Opening Reactor Recirc Pump B Discharge valve BB-HV-F031B.
- D. Closing RHR Pump B Min Flow valve BC-HV-F007B.

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Question: RO #10

Given:

- The plant is in OPCON 1.
- Irradiated fuel is being shuffled in the Spent Fuel Pool in preparation for new fuel arrival.

Then:

- The following VALID alarms are received in the Control Room:
  - RADIATION MONITORING ALARM/TRBL
  - NEW FUEL CRITICALITY RAD HI
  - REFUEL FLR EXH RAD ALARM/TRBL
  - RB EXH RADIATION ALARM/TRBL

Which of the following is the initial control room operator action for the conditions above IAW HC.OP-AB.CONT-0005, IRRADIATED FUEL DAMAGE?

- A. Suspend the handling of irradiated Fuel.
- B. Ensure Primary Containment Instrument Gas System isolates.
- C. Verify the Drywell Integrity Airlock surveillance test is current.
- D. Ensure the start of the 'A' AND 'C' SACS Pumps if not already running.

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Question: RO #11

Given:

- A LOCA has occurred.
- Suppression chamber sprays are initiated when Suppression Chamber pressure is 8.0 psig.
- Suppression Chamber pressure is 7.0 psig and lowering.

When are Suppression Chamber sprays required to be secured?

- A. Before 1.68 psig drywell pressure is reached.
- B. Before 0 psig suppression chamber pressure is reached.
- C. Before exceeding the capacity of the drywell-to-suppression chamber vacuum breakers.
- D. When chugging in the drywell downcomers is occurring.

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Question: RO #12

Given:

- The plant was operating at 100% rated power.

When:

- An inadvertent MSIV isolation occurred.
- Reactor water level reached -60 inches before recovering and is now at 0 inches and rising.
- The CRS orders HPCI placed into pressure control IAW HC.OP-AB.ZZ-0001, "Transient Plant Conditions".

In order to do this, the operator must first:

- A. ensure the HPCI VAC TK Vacuum Pump is running.
- B. press the HPCI Manual Initiation PB.
- C. start the HPCI Auxiliary Oil Pump.
- D. reset the HPCI Initiation Logic.

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Question: RO #13

Given:

- The plant is operating at 50% rated power.
- Suppression Pool cooling is in service.
- High Pressure Coolant Injection (HPCI) is operating in the CST to CST mode of operation IAW HC.OP-IS.BJ-0001(Q) - HPCI Main and Booster Pump Set – 0P204 and 0P217- In-service Test.
- Suppression pool temperature is 88°F and rising.

What are the requirements for entry into HC.OP-EO.ZZ-0102 "Primary Containment Control"?

ONLY when Suppression Pool temperature reaches \_\_\_\_\_ and continues to rise.

- A. 90°F
- B. 95°F
- C. 105°F
- D. 120°F

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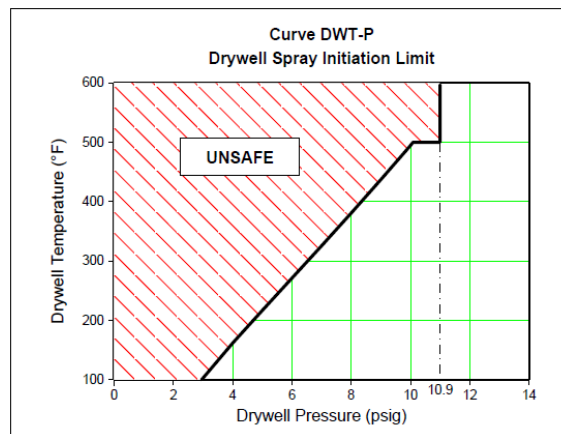
Question: RO #14

Given:

- The reactor has scrammed following a small steam line break in the drywell.

Current plant conditions:

- All control rods are full in.
- RPV level +30 inches and stable
- RPV pressure 920 psig and stable
- Suppression pool level 75 inches and stable
- Suppression pool temperature 120°F and rising 1°F/min
- Average drywell temperature 335°F and rising 2°F/min
- Suppression chamber pressure 3 psig rising 0.5 lbs./min
- Suppression chamber temperature 120°F and rising 0.5°F/min
- Drywell pressure 5 psig rising 0.5 lbs./min



Which of the following actions is required?

- A. Place RHR in Suppression Chamber spray and Drywell spray.
- B. Lower RPV pressure below Curve SPT-P, exceed cooldown rate if necessary.
- C. Place RHR in Suppression Pool cooling and Drywell spray.
- D. Immediately perform Emergency RPV Depressurization.

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Question: RO #15

Which ONE (1) of the following is the bases for the Suppression Pool level at which the primary containment pressure allowable limits could be exceeded and steam may not be adequately condensed?

- A. HPCI exhaust line becomes uncovered.
- B. Vent header drain lines become uncovered.
- C. Suppression Pool Technical Specification minimum water level value.
- D. Downcomers become uncovered.

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Question: RO #16

Given:

- The reactor is shutdown.
- All control rods fully inserted.
- Reactor pressure is 420 psig and stable.
- RPV level is being held relatively constant.

Then:

- 'C' RHR Loop receives a spurious LOCA level 1 signal.
- The OHA A6-A4 RHR LPCI LOOP C INITIATED is received.

Which of the following describes the status of "C" RHR?

- A. BC-HV F017C (LPCI Injection valve) indicates open and the 'C' RHR minimum flow control valve (HV-F007C) will indicate open.
- B. BC-HV F017C (LPCI Injection valve) indicates open and the 'C' RHR minimum flow control valve (HV-F007C) will indicate closed.
- C. BC-HV F017C (LPCI Injection valve) indicates closed and the 'C' RHR minimum flow control valve (HV-F007C) will indicate open.
- D. BC-HV F017C (LPCI Injection valve) indicates closed and the 'C' RHR minimum flow control valve (HV-F007C) will indicate closed.



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Question: RO #17

Given:

- A failure to scram has occurred.

Current conditions:

- Reactor power is at 65% rated power.
- The main turbine is on line.

The reactor recirculation pumps are required to be runback to minimum speed before tripping them to \_\_\_\_\_.

- A. maintain the largest margin to nuclear fuel failure limits.
- B. prevent power instabilities due to operating at high power without adequate core flow.
- C. prevent additional heat loading of the suppression pool if power remains above the bypass valve capacity.
- D. prevent an RPV high level trip to ensure HPCI injection flowpath.

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Question: RO #18

Given:

- An Unusual Event is declared due to a radiological release.
- The Meteorological Tower link to Hope Creek on SPDS is malfunctioning.
- The link to Salem Generating Station is working properly.

Which one of the following sets of data must be requested from Salem Station to be communicated to the States of New Jersey and Delaware with the Initial Contact Message Form (ICMF)?

- A. Wind Direction TO; Wind Speed 33 ft elevation.
- B. Wind Direction TO; Wind Speed 300 ft elevation.
- C. Wind Direction FROM; Wind Speed 33 ft elevation.
- D. Wind Direction FROM; Wind Speed 300 ft elevation.

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Question: RO #19

Given:

- The Plant is at 100% rated power.

Then:

- Overhead alarm A2-A5 "FIRE PROT PANEL 10C671" is received.
- The Fire Computer screen shows a fire in room 4208.
- The crew recognizes that HPCI has spuriously initiated.
- NO other control room overhead alarms are in.

**ATTACHMENT 2  
FIRE LOCATION BY ROOM NUMBER**

Room Number	LPCI/RHR				Core Spray				HPCI	RCIC	PCIG
	A	B	C	D	A	B	C	D			
4208									●		

Which one of the following actions is required, IAW HC.OP-AB.FIRE-0001 "Fire- Spurious Operations", for the above conditions?

- Terminate and prevent HPCI operation IAW HC.OP-AB.ZZ-0001 "Transient Plant Conditions".
- Place 'A' RHR in torus cooling due to HPCI being in-service IAW HC.OP-AB.ZZ-0001 "Transient Plant Conditions".
- Maintain reactor water level between level 4 and level 7 with HPCI in MANUAL IAW HC.OP-AB.RPV-0004 "Reactor Level Control".
- Place HPCI flow controller in MANUAL and control speed greater than 2150 RPM IAW HC.OP-SO.BJ-0001 "HPCI Operation".

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Question: RO #20

Given:

- The plant is at 100% rated power.

T=0:

- A SMD Alert of K7 is declared.
- ESOC Excess MVARs is in alarm.
- DC Neutral ground current is at 100 amps.
- HC.OP-AB.BOP-0004, Grid Disturbance has been entered.

T= 5 minutes:

- A fire is reported, burning directly below the 5015 line.
- The fire department is on scene of the fire.
- Yard NEO reports that the BX500 Main Power Transformer oil temperature is 105°C and rising at 2°C/minute.

**TABLE 1**

<b>Temperature Indicator</b>	<b>Alarm Setpoint</b>	<b>Max Normal</b>	<b>Max Peak</b>
Oil Temperature	105°C	110°C	120°C

T= 15 minutes:

Assuming the temperature trend above is constant, which of the following describes the plant status after operator action(s) is (are) completed?

- A. Reactor scrammed, turbine tripped. All 500 kv lines available.
- B. Reactor scrammed, turbine tripped. 5015 line removed from service.
- C. Main Gen online at a lower power level. 5015 line removed from service.
- D. Main Gen online at a lower power level. All 500 kv lines in-service.

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Question: RO #21

Given:

- A plant startup is in progress IAW HC.OP-IO.ZZ-0003, Startup from Cold Shutdown to Rated Power.
- Reactor power is at 11.5% rated power.

Then:

- The Common Offgas Recombiner train performance starts to degrade and needs to be removed from service.
- The Unit 1 Offgas Recombiner train is cleared and tagged and NOT available.

Which one of the following describes the action required to allow placing the the Mechanical Vacuum Pumps (MVP) in service IAW HC.OP-AB.BOP-0006, Main Condenser Vacuum abnormal and the reason for the power level reduction?

- A. Lower reactor power by 7%; Offsite radiological release may be above allowable limits at the North Plant Vent.
- B. Lower reactor power by 6%; Combustible gas concentrations may cause an explosion in the SJAE (Steam Jet Air Ejector) after condenser.
- C. Lower reactor power by 6%; Offsite radiological release may be above allowable limits at the South Plant Vent.
- D. Lower reactor power by 7%; Combustible gas concentrations may cause an explosion at the MVP.

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Question: RO #22

Given:

- The plant is operating at 100% rated power.

When:

- DRYWELL PRESSURE HI/LO annunciator alarm illuminates.
- Drywell pressure is 1.0 psig and slowly rising.
- HC.OP-AB.CONT-0001, Drywell Pressure abnormal is entered.

Which of the following actions are required for the current conditions and why?

- A. Reduce Drywell Inerting flow rate by 50% to prevent Torus to Drywell vacuum breaker operation.
- B. Ensure all Drywell fan cooling coils are open to the Drywell Coolers to maximize drywell cooling.
- C. Align RACS to supply a backup to the Chilled Water for Drywell Cooling Units to ensure maximum heat removal capability.
- D. Place Feedwater Sealing System in operation to eliminate Containment leakage to the Feedwater System.

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Question: RO #23

Given:

- The plant is shutdown.
- The reactor head is removed but NO fuel has been removed from the vessel.
- The "B" Residual Heat Removal loop is operating in Shutdown Cooling mode.
- Reactor coolant temperature is 82°F and lowering at 10°F/hr.

Which of the following would be the result if reactor coolant temperature is allowed to continue lowering at the same rate for another 90 minutes?

- A. The reactor vessel flange thermal stress limits will be exceeded.
- B. The RPV administrative cooldown rate limit will be exceeded.
- C. The calculated shutdown margin will be invalid.
- D. All the conditions required for brittle fracture of the RPV Belt line will be present.

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Question: RO #24

Given:

- The plant experiences a spurious trip.
- All control rods did NOT fully scram.
- Reactor power is at 18% rated power.
- Scram valves opened.
- Scram pilot valve air header is at 0 psig
- SDV (Scram Discharge Volume) is full.

Which one of the following actions is directed by HC.OP-EO.ZZ-0101A, ATWS-RPV Control using supplemental EOP procedures to perform control rod insertion with the above conditions?

- A. De-energize the scram solenoids IAW HC.OP-EO.ZZ-0102.
- B. Individually scram control rods IAW HC.OP-EO.ZZ-0303.
- C. Isolate and vent the scram air header IAW HC.OP-EO.ZZ-0306.
- D. Defeat RPS interlocks and initiate a manual scram IAW HC.OP-EO.ZZ-0320.



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Question: RO #25

Given:

- A gaseous radioactive release at a rate above the ALERT level has occurred.
- HC.OP-EO.ZZ-0103/4, Reactor Building & Rad Release directs restarting the Turbine Building Ventilation if shutdown.

What is the BASES behind this action?

- A. To provide an elevated, monitored release point.
- B. To provide filtering to reduce radioactive releases.
- C. To prevent the radioactive gaseous release.
- D. This action is solely for personnel habitability.

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Question: RO #26

Given:

- The plant experiences a transient.

Current plant conditions:

- |                          |                                |
|--------------------------|--------------------------------|
| • Reactor power          | Reactor shutdown               |
| • Reactor pressure       | 25 psig and stable             |
| • Reactor level          | +40 inches and slowly lowering |
| • Drywell pressure       | 1.53 psig and slowly rising    |
| • Suppression pool level | 87" and stable                 |
| • Suppression pool temp  | 102°F and slowly rising        |

Which of the following actions must be taken to control Suppression Pool Level IAW EOP's?

- A. Lower suppression pool level using RCIC.
- B. Lower suppression pool level using Core Spray.
- C. Lower suppression pool level using RHR Loop 'B' to Radwaste.
- D. Terminate injection to the RPV from Feedwater.

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Question: RO #27

Given:

- The reactor is operating at 100% rated power.
- OHA “CORE SPRAY PUMP ROOM FLOODED” is illuminated.
- An investigation reveals that the “D” Core Spray pump room floor level is 2.5 inches and stable.
- All RPV parameters are normal.

<b>TABLE 2</b>		
Area Description & Room Number	Column 1 Max Normal Op Floor Level	Column 2 Max Safe Op Floor Level
CRD Pump Room (4202)	1 in	4 1/2 in (25 min continuous running)
HPCI (4111)	1 in	4 1/2 in (30 min continuous running)
Core Spray Pump Rooms A(4118) & C(4116)	1 in	4 1/2 in (15 min continuous running)
RHR Pump Rooms A(4113) & C(4114)	1 in	4 1/2 in (20 min continuous running)
SACS A & C (4308)	1 in	4 1/2 in (INVESTIGATE)
RCIC Pump Room (4110)	1 in	4 1/2 in (17 min continuous running)
Core Spray Pump Rooms B(4104) & D(4105)	1 in	4 1/2 in (15 min continuous running)
RHR Pump Rooms B(4108) & D(4107)	1 in	4 1/2 in (20 min continuous running)
SACS B & D (4307)	1 in	4 1/2 in (INVESTIGATE)

IAW HC.OP-EO.ZZ-0103/4, Reactor Building & Rad Release, the operators must \_\_\_\_\_.

- immediately commence a normal reactor shutdown.
- ensure all available sump pumps are in operation.
- emergency depressurize the reactor.
- runback reactor recirculation and initiate a manual scram.

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Question: RO #28

Given:

- A severe transient has occurred.

Current plant conditions:

- Suppression Chamber pressure: 10 psig
- Suppression Pool temperature: 240 °F
- Suppression Pool level at 38"
- Reactor pressure: 100 psig
- RPV Water Level is –100 inches and rising.
- RHR "A" pump flow: 10,000 gpm
- Core Spray "B" pump Flow: 1500 gpm
- All other low pressure ECCS pump are NOT in service.

Determine if Net Positive Suction Head (NPSH) requirements are being met.

**[Reference attached]**

- A. There is sufficient NPSH for both the "A" RHR pump and the "B" Core Spray Pump.
- B. There is sufficient NPSH for the "A" RHR pump ONLY.
- C. There is sufficient NPSH for the "B" Core Spray Pump ONLY.
- D. There is NOT sufficient NPSH for any pump.

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Question: RO #29

Given:

- A reactor cooldown was in progress with 'B' RHR in the Shutdown Cooling (SDC) mode of operation.
- SACS cooling to 'B' RHR HX valve EG-HV-2512B just inadvertently closed.

At 1500:

- Reactor coolant pressure is at 52 psig.
- Reactor coolant temperature is at 300°F.
- Reactor coolant temperature is rising at 2°F/min.

At which one of the following times will SDC automatically isolate assuming NO operator action and constant heat up rate?

- A. 1506
- B. 1513
- C. 1523
- D. 1526

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Question: RO #30

Given:

- The plant is currently in Operational Condition 4
- RHR loop "B" aligned in the shutdown cooling mode.
- The RHR A(B) FPC MODE SUCT VLV CLOSURE TRIP OVERRIDE keylock switch is in the 'NORM' position.
- HC.OP-GP.SM-0001, Defeating Isolation Signals During Shutdown Cooling Operations has NOT been completed.

Then:

- A crack develops in the suction piping at the "B" reactor recirculation loop connection causing reactor water level to lower.
- Reactor water level begins to lower from normal water level to -135" and lowering.

Assuming NO operator action, which of the following statements describes the automatic response of the "B" RHR loop?

- A. F008, F009 (SDC Suction) and F015B (SDC Return) remain open.  
F017B (LPCI Injection) and F048B (HX Bypass) open.  
The "B" RHR pump remains running and injects to the RPV.
- B. F008, F009 (SDC Suction) and F015B (SDC Return) shut.  
The "B" RHR pump trips.  
F017B (LPCI Injection) and F048B (HX Bypass) open.  
The "B" RHR pump restarts and injects to the RPV.
- C. F008, F009 (SDC suction) and F015B (SDC Return) remain shut.  
The "B" RHR pump trips.  
F017B (LPCI Injection) and F048B (HX Bypass) open.  
The "B" RHR pump does not attempt to restart.
- D. F008, F009 (SDC Suction) and F015B (SDC Return) shut.  
The "B" RHR pump trips.  
F017B (LPCI Injection) and F048B (HX Bypass) open.  
The "B" RHR pump attempts to restart and immediately trips.

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Question: RO #31

What is the power supply to the HPCI Inboard Steam Supply Isolation Valve (FD-HV-F002) and the HPCI Outboard Steam Supply Isolation Valve (FD-HV-F003)?

- |    | <u>HV-F002</u> | <u>HV-F003</u> |
|----|----------------|----------------|
| A. | 10B212         | 10B222         |
| B. | 10B232         | 10B212         |
| C. | 10B222         | 10B212         |
| D. | 10B212         | 10B232         |

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Question: RO #32

Given:

- 1E 125 VDC bus 1AD417 is out of service due to an electrical fault.

Then:

- A leak develops inside the drywell from an unidentified source.
- Drywell pressure is at 7.3 psig and rising.
- RPV level is at -118" and lowering.
- RPV pressure is at 300 psig and slowly lowering.

What is the total Core Spray system injection flow?

- A. approximately 3175 gpm
- B. approximately 6350 gpm
- C. approximately 9525 gpm
- D. approximately 12,700 gpm



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Question: RO #33

Given:

- 'A' Core Spray Pump is running in the test return mode for a scheduled surveillance.

Then, a plant transient results in the following conditions:

- A leak into the drywell with pressure at 2.15 psig and slowly rising.
- Reactor water level at -50 inches and stable.
- Reactor pressure at 690 psig and stable.

Select the system response for these conditions.

- A. The 'A' Core Spray Pump continues to run on minimum flow, the CSS Full Flow Test Valve (HV-F015A) closes and the CS Loop Injection Valve (HV-F005A) opens.
- B. The 'A' Core Spray Pump trips, the CSS Full Flow Test Valve (HV-F015A) closes, then the pump restarts and CS Loop Injection Valve (HV-F005A) opens.
- C. The 'A' Core Spray Pump continues to run on minimum flow, the CSS Full Flow Test Valve (HV-F015A) closes and the CS Loop Injection Valve (HV-F005A) does not reposition.
- D. The 'A' Core Spray Pump trips, the CSS Full Flow Test Valve (HV-F015A) closes, then the pump restarts and runs on minimum flow and CS Loop Injection Valve (HV-F005A) does not reposition.

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Question: RO #34

SELECT the answer below that correctly describes what portions of the Standby Liquid Control System (SLC) that are heat traced and why this is done.

- A. The pump suction lines, including the pump heads are heat traced to ensure the sodium pentaborate remains in solution.
- B. All system piping, including the pump heads are heat traced to ensure the sodium pentaborate remains in solution.
- C. The pump suction lines, including the pump heads are heat traced since sodium pentaborate at higher temperatures makes a better poison (neutron absorber).
- D. All system piping, including the pump heads are heat traced since sodium pentaborate at higher temperatures makes a better poison (neutron absorber).

2019 NRC Written Examination

Question: RO #35

T=0:

- A plant start up is in progress IAW HC.OP-IO.ZZ-0003, Startup from Cold Shutdown to Rated Power.
- The Reactor is at 15% rated power.
- The Main Turbine is synchronized to the grid and loaded.
- The RX RECIRC PUMPS RPS TRIP BYP alarm (C1-E3) is NOT illuminated.

T= 60 seconds:

- RPS Bus 'B' is de-energized due to a ground fault.
- Crew has entered HC.OP-AB.IC-0003, Reactor Protection System.

T= 70 seconds:

- A spurious Main Turbine Trip occurs.

What is the initial immediate response, if any, of the plant to the Main Turbine trip?

- A. Reactor Scram will occur.
- B. Both Reactor Recirculation Pumps will trip.
- C. ONLY the 'B' Reactor Recirculation Pump will trip.
- D. Neither a Reactor Recirculation Pump trip nor Reactor Scram will occur.

2019 NRC Written Examination

Question: RO #36

Given:

- With the plant at 50% rated power.

What is the:

- Largest number of MSIVs that can be closed AND NOT directly produce a Reactor Protection System (RPS) FULL scram signal?
- Smallest number of MSIVs that can be closed AND directly produce a Reactor Protection System (RPS) FULL scram signal?

- A. 5  
3
- B. 4  
2
- C. 5  
2
- D. 4  
3

2019 NRC Written Examination

Question: RO #37

Given:

- The reactor is being shutdown for a refueling outage.
- Reactor power is at 10% rated power with the Mode Switch in RUN.
- Seven IRM's have been inserted with their range switch positioned to establish 25 to 75% scale.
- "G" IRM failed to drive in and its range switch is placed on range 3 to establish 25 to 75% scale.

Which of the following describes the plant response, if any, if the Reactor Mode Switch is placed in Startup/Hot Standby?

- A. Only a rod block will be automatically generated.
- B. Only a half scram and rod block will be automatically generated.
- C. A full scram and rod block will be automatically generated.
- D. NO rod block, half or full scram will be generated.

2019 NRC Written Examination

Question: RO #38

Given:

- During a reactor startup all SRMs are fully retracted (withdrawn from the core boundary).
- The Reactor Mode Switch is in Startup/Hot Standby.
- All IRMs range switches are on range 5 or 6.
- All SRM 'OUT' lamps are illuminated on the SRM Detector Select panel.

Then:

- The SRM UPSCALE OR INOPERATIVE (C3-C1) alarm is received due to a problem with SRM Channel 'A'.
- The crew enters HC.OP-AB.IC-0004, Neutron Monitoring.

Which of the following conditions would cause the above alarm?

- (1) SRM drive mechanism electrical failure.
- (2) SRM high voltage input is low.
- (3) SRM module unplugged.
- (4) SRM Mode Switch in PERIOD.

- A. (1), (2) and (4)
- B. (1), (2) and (3)
- C. (2), (3) and (4)
- D. (1), (3) and (4)

2019 NRC Written Examination

Question: RO #39

Given:

- The plant is at 100% rated power.

When:

- The 1AN414, BD483 Neutron Monitoring Electrical Protection Assembly (EPA) breaker trips.
- The cause of the trip is unknown at this time.

What is the status of the plant and what additional action is required?

- A. Half scram from 'B' and 'D' APRM. Bypass 'B' and 'D' APRM.
- B. Half scram from the 'B' and 'D' PRNM 2 out of 4 Voters. Reset 1AN414 once the cause is known.
- C. Half scram from 'B' and 'D' APRM. Reset 1AN414 once the cause is known.
- D. Half scram from the 'B' and 'D' PRNM 2 out of 4 Voters. Bypass 'B' and 'D' APRM.

2019 NRC Written Examination

Question: RO #40

Given:

- RCIC received a valid initiation signal.

The plant operator (PO) finds the following indications:

- The RCIC turbine trip throttle valve (FC-HV-4282) indicates closed.
- The RCIC Turbine Trip Status light is illuminated.
- The RCIC Inboard and Outboard Steam line Isolation valves (FC-HV-F007) and (FC-HV-F008) are open.
- The steam supply valve (FC-HV-F045) is open.
- RCIC speed is zero.

SELECT the condition that caused the current RCIC response.

- A. High reactor water level at +54".
- B. Turbine Exhaust diaphragm ruptured.
- C. RCIC suction pressure at 15 inHg.of vacuum.
- D. Mechanical Overspeed.



2019 NRC Written Examination

Question: RO #41

Given:

- An MSIV isolation and scram from 100% rated power occurred.
- The Lo-Lo Set SRV's cycled several times.
- CRIDS is unavailable.

How does the operator know how many times each SRV opened?

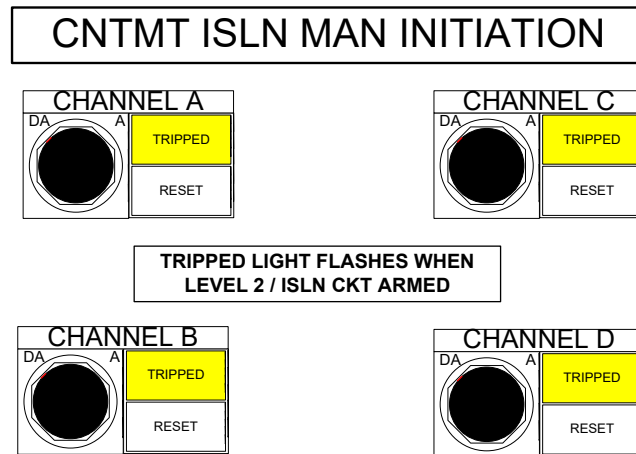
- A. SRV Acoustic Monitor function switch is placed in "T" mode.
- B. SRV Tailpipe Temp recorder is placed in "RECORD" mode.
- C. SRV Tailpipe Temp recorder is placed in "DATA" mode.
- D. SRV Acoustic Monitor function switch is placed in "C" mode.

2019 NRC Written Examination

Question: RO #42

Given:

- Reactor Building ventilation has isolated due to a valid -38" RPV level condition.
- RPV level has been restored to +35".
- CNTMT ISLN MAN INITIATION TRIPPED lights are flashing.



In order to reset the isolation IAW plant procedures AND allow the Reactor Building Isolation Dampers to be reopened, the operator must reset \_\_\_\_\_.

- A. PCIS isolation ONLY.
- B. NS<sup>4</sup> isolation AND PCIS isolation.
- C. NS<sup>4</sup> isolation ONLY.
- D. Core Spray initiation logic.

2019 NRC Written Examination

Question: RO #43

Given:

- The Plant is at 100% rated power.

Then, 'A' SRV fails full open:

- The operators are monitoring the main steam line flow indicators (FI-R603A-D).
- OHA C1-A3 ADS/SAFETY RELIEF VLV NOT CLOSED is in alarm.
- HC.OP-AB.RPV-0006, "Safety Relief Valve" abnormal has been entered, but NO operator actions have been taken.

Which of the following describes the indicated steam flow response (FI-R603A-D) with the open Safety Relief Valve (SRV) and the reason for that response?

- A. Indicated steam flow goes down, because the SRV steam flow is not monitored by the main steam system flow detectors.
- B. Indicated steam flow will remain steady, because SRV steam flow is seen as additional steam flow over what is going to the main turbine.
- C. Indicated steam flow goes up, because the Turbine Control Valves and Intercept Valves throttle open to maintain a steady MWe output.
- D. Indicated steam flow will remain steady, because the Turbine Control Valves throttle closed to maintain a steady reactor pressure.

2019 NRC Written Examination

Question: RO #44

HPCI is unavailable for manual or automatic initiation with \_\_\_\_\_ unavailable?

- A. 125 VDC 10D420
- B. 120 VAC 1CD482
- C. 125 VDC 10D410
- D. 120 VAC 1AD482

2019 NRC Written Examination

Question: RO #45

Given:

- The plant is at 50 percent rated power.
- The FRVS Recirculation Fans are in AUTO.

T=0:

- A Loss of Offsite Power occurs.
- HPCI and RCIC are manually initiated.
- Minimum RPV water level reached was -25 inches.

T=3 minutes:

SELECT the approximate total FRVS recirculation flow. (Assume NO other operator actions).

- A. 0 cfm
- B. 60,000 cfm
- C. 120,000 cfm
- D. 180,000 cfm

2019 NRC Written Examination

Question: RO #46

Given:

- Rx power is at 55% rated power.
- Two Reactor Building Ventilation System (RBVS) supply fans running [A & BVH-300].
- Two Reactor Building Ventilation System (RBVS) exhaust fans running [B & CVH-301].
- "A" Filtration Recirculation Ventilation System (FRVS) vent fan is in AUTO [AV-206].

If a pair of reactor building-to-suppression chamber vacuum breakers fails open, which one of the following describes the response of the Reactor Building Ventilation System (RBVS)?

- A. The third RBVS exhaust fan starts [AVH-301].
- B. The "A" FRVS vent fan initiates [AV-206].
- C. The RBVS Exhaust discharge dampers throttle open as needed to maintain delta pressure.
- D. The third RBVS supply fan starts [CVH-300].

2019 NRC Written Examination

Question: RO #47

Given:

- The reactor is at 55% rated power.
- All vital bus normal in-feed breakers are closed.
- The vital bus alternate in-feed breakers are open.

Then:

- Drywell pressure begins to rise and OHA "DRYWELL PRESS HI/LO" (A7-E4) alarms.

At T=0 seconds:

- The High Drywell Pressure scram setpoint is reached and drywell pressure continues to rise slowly.
- The reactor scrams and all control rods fully insert.
- Reactor level lowers to -10 inches and begins to recover.
- All expected automatic actions occur.

At T=60 seconds:

The "A" RHR (1AP202) pump is powered via the \_\_\_\_\_.

- "A" Emergency Diesel Generator and the pump started via the RHR logic.
- 1AX501 Station Service Transformer and the pump started via the LOCA Sequencer.
- "A" Emergency Diesel Generator and the pump started via the LOCA Sequencer.
- 1AX501 Station Service Transformer and the pump started via the RHR logic.

2019 NRC Written Examination

Question: RO #48

Given:

- The plant is at 100% rated power.
- Reactor Protection System (RPS) buses are aligned to their normal power supply.

Then:

- The BN410 RPS EPA (Electrical Protection Assembly) breaker trips due to a sensed 135 VAC on its Overvoltage trip device.

Which of the following is the plant response to the trip of the BN410 EPA breaker?

- A. "A" RPS bus will lose power immediately.
- B. "A" RPS bus will lose power in 1-3 seconds.
- C. "B" RPS bus will lose power in 1-3 seconds.
- D. "B" RPS bus will lose power immediately.



2019 NRC Written Examination

Question: RO #49

Given:

- The plant is operating at 100% rated power.

When:

- A LOCA Level 1 concurrent with a LOP occurs.
- All Emergency Diesel Generators started and responded as designed.

30 seconds after the event:

Which of the following describes the status of the 1E and Non-1E 125 VDC Battery Chargers?

- A. 1E and Non-1E battery chargers are load shed.  
1E battery chargers will be automatically restored by load sequencing.  
Non-1E battery chargers will be restored 2 minutes after the sequencer starts.
- B. 1E and Non-1E battery chargers are load shed but will be automatically restored at the same time by load sequencing.
- C. 1E battery chargers are in service.  
Non-1E battery chargers are load shed and can be manually restored by overriding the load shed and re-energizing the MCC's.
- D. 1E battery chargers are in service.  
Non-1E battery chargers are load shed and CANNOT be returned to service.

2019 NRC Written Examination

Question: RO #50

Given:

- The "A" EDG is paralleled to the 10A401 bus for a surveillance test IAW HC.OP-ST.KJ-0001, 1AG400 Operability Test.
- Generator Terminal Voltage is at 4160 Volts.
- Generator Phase Current for all three phases is at 600 amps.
- Generator Power is at 4300 KWs.
- Generator Reactive Load is at 1000 KVARs.
- Generator Frequency is at 60Hz.
- All EDG pressures and temperatures are within specifications IAW the surveillance test.

Then:

- The Plant Operator (PO) begins to unload the "A" EDG to remove it from the 10A401 bus by depressing the DIESEL ENG GOV DECR pushbutton, when it becomes stuck in the depressed position.

If NO operator action is taken, what will be the EDG terminal voltage and eventual diesel response to this condition?

- A. lower AND then the diesel will trip on reverse power.
- B. lower AND then the diesel will trip on generator overcurrent.
- C. remain constant until the diesel trips on reverse power.
- D. remain constant until the diesel trips on generator overcurrent.

2019 NRC Written Examination

Question: RO #51

Given:

- The plant is starting up IAW HC.OP-IO.ZZ-0003, Startup from Cold Shutdown to Rated Power.
- Feedwater flow is being controlled thru the Startup Level Control Valve-LV-1785 manually.
- The "B" RFPT is warmed up and operating in minimum flow recirc.

Then:

- Vibration causes the air supply line to Startup Level Control Valve-LV-1785 AND RFP Minimum Flow Recirculation Valve-FV-1783B to break loose from the valve controllers.

How does the Feedwater System respond?

- A. The feedwater pump remains running and the FV-1783B fails open. The startup level control flowpath is lost.
- B. The feedwater pump trips when the FV-1783B fails closed. The startup level control flowpath is lost.
- C. The feedwater pump remains running and the FV-1783B fails closed. The startup level control flowpath remains in service.
- D. The feedwater pump remains running and the FV-1783B fails open. The startup level control flowpath remains in service.

2019 NRC Written Examination

Question: RO #52

Given:

- The plant is at 100% rated power.
- Instrument Air Dryers 00-F-104 and 10-F-104 are both IN SERVICE.
- Instrument Air Dryer 1A-F-104 is in standby with hand switch HS-11416 in the STANDBY position.

When, a lowering of the instrument air header pressure to  $\approx$  80 psig occurs.

The following is the current status of the Instrument Air System:

- The Standby Service Air Compressor has auto started.
- The Emergency Instrument Air Compressor has auto started.
- RACS Demineralizers have isolated.
- Both 00-F-104 and 10-F-104 Air Dryers are INSERVICE.
- Instrument Air Header is at  $\approx$  78 psig and continues to slowly lower.

Has the Instrument Air System responded properly to the lowering of the Instrument Air Header pressure and what action(s) will need to be completed IAW HC.OP-AB.COMP-0001, Instrument and/or Service Air?

- A. Did NOT respond properly; REDUCE Recirc to minimum and LOCK the mode switch in shutdown when instrument air header pressure lowers to 75 psig.
- B. Did respond properly; ISOLATE system leaks to determine where the leak is coming from.
- C. Did NOT respond properly; ENSURE HV-11416 for 1A-F-104 Instrument Air Dryer is open.
- D. Did respond properly; ENSURE HV-7595 Service Air Supply Header Isolation Valve is closed when instrument air header pressure lowers to 70 psig.

2019 NRC Written Examination

Question: RO #53

Given:

- EA-HV-2346, RACS Heat Exchanger Outlet AND EA-HV-2207 RACS Heat Exchanger Inlet Valves, have isolated.
- No surveillances are in progress.
- No overhead alarms are received due to the valves isolating.

Which of the following caused the valves to stroke close?

- A. RACS room flooded  $\geq 1$ " isolation on the "C" channel (LSH-2365C).
- B. Reactor Level at -140".
- C. Loss of Offsite Power (LOP).
- D. High Drywell Pressure at 1.98#.

2019 NRC Written Examination

Question: RO #54

Given:

- Refueling is in progress.
- Mode switch in REFUEL.
- Fuel Grapple loaded with a fuel bundle.
- Refuel bridge is over the spent fuel pool.
- All control rods fully inserted.

Which one of the following conditions will generate a Rod Block?

- A. A control rod is selected on the Rod Select Matrix.
- B. The refuel bridge is moved over the core
- C. The Main Hoist Loaded light is illuminated.
- D. The Fuel Grapple control is placed in the RAISE position.

2019 NRC Written Examination

Question: RO #55

Given:

- The plant is operating at 100% rated power near the end of core life.
- All control rods are fully withdrawn.

When:

- The scram outlet valve for control rod 30-31 develops an air leak and the valve slowly opens.

T=5 minutes:

Which one of the following describes the response of the plant?

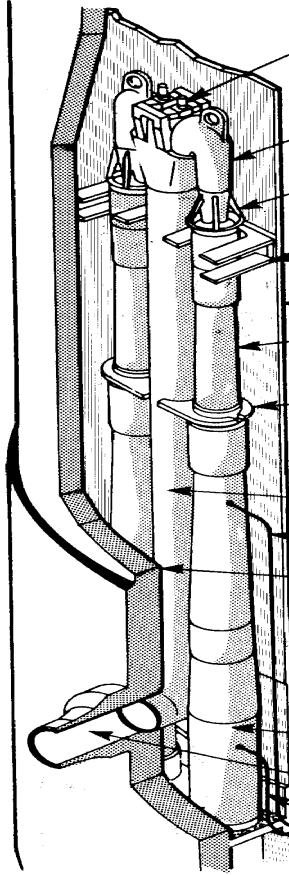
Reactor power will \_\_\_\_\_ (1) \_\_\_\_\_ and the control rod 30-31 will \_\_\_\_\_ (2) \_\_\_\_\_.

- A. (1) lower, but the plant will continue to operate at power  
(2) insert with NO leakage into the Scram Discharge Volume
- B. (1) remain at 100 % reactor power  
(2) NOT move along with NO leakage into the Scram Discharge Volume
- C. (1) lower, but the plant will continue to operate at power  
(2) insert with leakage into the Scram Discharge Volume
- D. (1) be <4% on APRMs  
(2) insert due to the Reactor Scram on Scram Discharge Volume Level-Hi

Question: RO #56

Given:

- A hole develops in the diffuser section of a jet pump.



Which one of the following is a potential consequence of continued operations with this condition?

- A. The vibration related "noise" will cause power oscillations.
- B. Less than 2/3 of the core height will be re-flooded following a DBA LOCA.
- C. Total reactor power will be higher than expected.
- D. The associated reactor coolant loop reactor recirculation pump will lose NPSH.



2019 NRC Written Examination

Question: RO #57

Given:

- Core Alterations are in progress.
- RHR Loop "A" is in Shutdown Cooling.
- RPV Coolant Temperature is at 100°F.
- RHR Loop "B" is in Fuel Pool Cooling Assist.
- Both Fuel Pool Cooling Pumps are Cleared & Tagged for repairs.
- RWCU is in service with Blowdown flow at 25 gpm for level control.
- A flow controller malfunction causes Blowdown Flow Control Valve (HV-F033) to open fully.
- No operator action is taken.

Which of the following will be the effect of the conditions above?

- A. Skimmer Surge Tank level will lower until the Fuel Pool weirs are uncovered, and then will remain at the level of the weirs.
- B. Cavity level will continue to lower until level reaches +12.5".
- C. Cavity level will lower until the Cavity weirs are uncovered, and then will remain at the level of the weirs.
- D. Cavity level will continue to lower until level reaches -38".

2019 NRC Written Examination

Question: RO #58

Given:

- 120 VAC UPS TROUBLE Annunciator D3-E3 alarms.
- 1BD481 inverter 120 VAC output is lost.

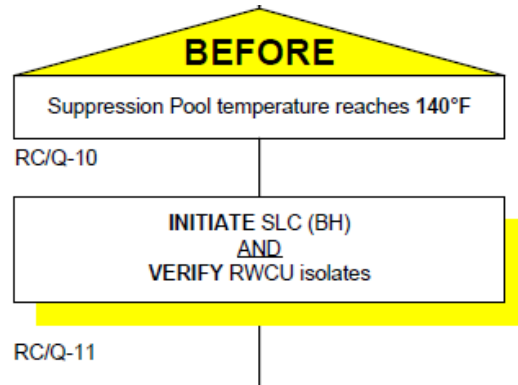
What affect will the loss of the 120 VAC have on the Nuclear Boiler Instrumentation System?

- A. "B" and "D" Channel ECCS Rosemount Trip Units will lose power and the analog RPV level indications will fail upscale.
- B. "B" and "F" Channel ECCS Rosemount Trip Units will lose power and the analog RPV level indications will fail upscale.
- C. "B" and "D" Channel ECCS Rosemount Trip Units will lose power and the analog RPV level indications will fail downscale.
- D. "B" and "F" Channel ECCS Rosemount Trip Units will lose power and the analog RPV level indications will fail downscale.

2019 NRC Written Examination

Question: RO #59

In EOP 101A, "ATWS – RPV Control," step RC/Q-10, what is the primary basis for initiating Standby Liquid Control (SLC) before suppression pool temperature reaches 140°F?



- A. To initiate a reactor shutdown, which will help prevent further suppression pool temperature rise and avoid challenging or exceeding the maximum design temperature limit of the suppression pool (torus) structure.
- B. To permit injection of the Cold Shutdown Boron Weight of boron before suppression pool temperature exceeds the Heat Capacity Temperature Limit.
- C. To permit injection of the Hot Shutdown Boron Weight of boron before suppression pool temperature exceeds the Heat Capacity Temperature Limit.
- D. To initiate a reactor shutdown and ensure cooldown rates of the reactor do not exceed Technical Specification or design requirements.

2019 NRC Written Examination

Question: RO #60

Given:

- The plant is operating at 60% rated power during a plant startup.
- "A", "B", and "C" Primary Condensate Pumps (PCP) are running.
- "B" and "C" Secondary Condensate Pumps (SCP) are running.
- "A" and "C" Reactor Feed Pumps (RFP) are running.

When:

- The "B" and "C" Primary Condensate Pumps (PCP) trip.

Which of the following actions, in regards to the Condensate or Feedwater System pumps, is required IAW HC.OP-SO.AD-0001, Condensate System Operations?

- A. Manually trip "A" or "C" Reactor Feed Pump.
- B. Manually trip "B" and "C" Secondary Condensate Pumps.
- C. Manually trip "A" and "C" Reactor Feed Pumps.
- D. Manually trip "B" or "C" Secondary Condensate Pump.

2019 NRC Written Examination

Question: RO #61

Given:

- The plant is operating at 100% rated power.
- The "A" Reactor Feedwater Pump is in service and in AUTO.

Following a plant transient, the following conditions exist:

- The reactor failed to scram when required.
- Reactor power is at 14%.
- Reactor pressure is at 1105 psig.
- Reactor water level is at 15".

One minute later:

- Reactor power is at 10%.
- Reactor pressure is at 1080 psig.
- Reactor water level is at 25".
- The "A" Reactor Feed Pump speed has lowered to approximately 2500 rpms and remains steady.
- The "RFP TURBINE AUTO XFR TO MANUAL" (B3-F3) annunciator is in alarm.
- The 'MAN CONTROL AVAIL' indicating light on 10C651B is illuminated.
- The lowest Reactor water level reached was 15".

The "A" Reactor Feed Pump is responding to \_\_\_\_\_.

- A. the Setpoint Setdown feature of Digital Feedwater Control.
- B. a Redundant Reactivity Control System runback.
- C. a Control Signal Failure.
- D. a gross failure of a Main Steam Flow transmitter.

2019 NRC Written Examination

Question: RO #62

Given:

- The plant is operating at 100% rated power.
- The first reactor building equipment drain sump pump (AP-266) starts.
- Two minutes later the reactor building equipment sump (AT266) reaches the hi-hi level setpoint.
- OHA D3-C2 "REACTOR BLDG SUMP LVL HI/LO" is in alarm.
- No other overhead alarms are in.

Based on this:

- A. The high leak rate detection timer (AP/BP266 TIMER RESET) must be reset.
- B. HC.OP-EO.ZZ-0103/4, Reactor Building & Rad Release Control, must be entered.
- C. HC.OP-AB.CONT-0006, Drywell Leakage, must be entered.
- D. The second reactor building equipment drain sump pump (BP-266) will be running.

2019 NRC Written Examination

Question: RO #63

Given:

- A plant startup is in progress following a forced outage.
- The plant has been operating with a known fuel leak.
- 'A' Mechanical Vacuum Pump (MVP) is in service with the suction valve throttled.
- The Main Condenser Vacuum Breakers are closed.

What action is required if the South Plant Vent (SPV) RMS Effluent reaches the HIGH (RED) alarm setpoint?

- A. Enter HC.OP-AB.CONT-0004, Radioactive Gaseous Release, and stop the MVP.
- B. Enter HC.OP-AB.CONT-0004, Radioactive Gaseous Release, and throttle MVP Suction valve further closed.
- C. Enter HC.OP-EO.ZZ-0103/4, Reactor Building & Radioactive Release Control, and stop the MVP.
- D. Enter HC.OP-EO.ZZ-0103/4, Reactor Building & Radioactive Release Control, and throttle MVP Suction valve further closed.

2019 NRC Written Examination

Question: RO #64

Given:

- The plant is at 100% rated power.
- The 'A' Control Room Chiller (AK400) and the circulating water pump (1AP-400) is in-service.
- The 'A' TSC Chiller (AK403) and the circulating water pump (1AP-414) is in-service.
- The Reactor Building Ventilation System is in service with Reactor Building Unit Cooler Control Panel, 1A(B,C,D)C-281 hand switches positioned as follows:
  - AVH214 SACS room cooler handswitch in 'AULD'
  - BVH214 SACS room cooler handswitch in 'AULD'
  - CVH214 SACS room cooler handswitch in 'AUTO'
  - DVH214 SACS room cooler handswitch in 'AUTO'

Then:

- The AVH214 SACS room cooler trips.

Which of the following describes how the SACS Room ventilation is affected?

- A. Standby SACS Pumps Room Fan CVH214 auto starts. No other auto actions occur.
- B. The Standby Control Area Chiller and associated fans auto-start. The Standby SACS Pumps Room Fan CVH214 auto starts.
- C. The associated SACS pumps room is without ventilation unless the standby fan is manually started. No other plant equipment is affected.
- D. The associated SACS pumps room is without ventilation unless the standby fan is manually started. The Standby Control Area Chiller and associated fans auto-start.



2019 NRC Written Examination

Question: RO #65

Given:

- The plant has experienced a Loss of Coolant Accident (LOCA) from a high drywell pressure signal of 1.68 psig.
- The LOCA signal has cleared and has been reset.

WHAT actions must be taken to restore the Reactor Building Ventilation Supply (RBVS) and Reactor Building Ventilation Exhaust (RBVE) fans?

The \_\_\_\_ (1) \_\_\_\_ breakers for both Rx Building Supply and Exhaust fans must be manually closed, then the fans will be restarted from the \_\_\_\_ (2) \_\_\_\_.

- A. (1) 1-E  
(2) local controls (10C382)
- B. (1) 1-E  
(2) main control room (MCR)
- C. (1) Non 1-E  
(2) main control room (MCR)
- D. (1) Non 1-E  
(2) local controls (10C382)

## 2019 NRC Written Examination

Question: RO #66

You are a licensed Reactor Operator. Due to illness, you have worked the following schedule over the past quarter of 2018 (July thru September).

- July 1 - Off
- July 2 - Off
- July 3 - 12 hour day shift as RO
- July 4 -12 hour day shift as RO
- July 8 -12 hour night shift as RO
- July 9 - 12 hour night shift as RO
- July 10 Through September 30 – Off Shift due to illness.

All licensed operator training is up to date.  
You're received medical clearance to stand watch.

Which one of the following describes the status of your license and an additional requirement, if any, to stand watch during the 4th quarter of 2018 IAW OP-AA-105-102 "NRC ACTIVE LICENSE MAINTENANCE?"

- A. Your license is Inactive. You must perform shift functions under the sole direct supervision of an active licensed RO for at least seven (7) eight hour shifts OR five (5) 12 hour shifts as part of the reactivation and perform a complete plant walkdown.
- B. Your license is Active because you stood watch for at least 40 hours the previous quarter. NO additional requirements are needed to stand watch in the 4th quarter of 2018.
- C. Your license is Inactive. You must perform shift functions under the sole direct supervision of ONLY an active licensed SRO for at least 40 hours as part of the reactivation and perform a complete plant walkdown.
- D. Your license is Inactive. You must perform shift functions under the sole direct supervision of an active licensed RO for at least 40 hours as part of the reactivation and perform a complete plant walkdown.

2019 NRC Written Examination

Question: RO #67

The desired plant lineup requires which of the following set of keys to be inserted into their key lock switches?

- A. Scram Discharge Volume Hi Level Scram Bypass Switch and 4 RPS Channel Switches.
- B. Scram Discharge Volume Hi Level Scram Bypass Switch and Rod Worth Minimizer Switch.
- C. HPCI and RCIC Steam Line Isolation Valve Switches and 4 RPS Channel Switches.
- D. HPCI and RCIC Steam Line Isolation Valve Switches and Rod Worth Minimizer Switch.

2019 NRC Written Examination

Question: RO #68

Given:

- The on-duty RO was selected for random fitness-for-duty testing.
- The CRS provided relief for the RO.
- The time away from the Control Room was 45 minutes.

What is the minimum requirement(s) that must be completed prior to the on-duty RO resuming the watch IAW OP-AA-112-101, Shift Turnover And Relief?

- A. Review the Shift Turnover Checklist and a brief of any changes that occurred during the relief period.
- B. A brief on plant status to include all safety-related equipment.
- C. A complete board walkdown, and Shift Turnover brief is required.
- D. Complete a turnover that is comprehensive enough to ensure the relief person is fully cognitive of plant status and aware of ongoing activities.

2019 NRC Written Examination

Question: RO #69

Given:

- In the process of reviewing the procedure for a system to be started during your shift, it is determined that an initial condition must be deleted.
- This deletion will change the operation of the system.

Which of the following correctly describes how the change to this procedure should be handled?

- A. A partial use.
- B. A non-permanent change.
- C. An on-the-spot change.
- D. A full revision.

2019 NRC Written Examination

Question: RO #70

IAW the Safety Tagging Program procedure, OP-AA-109-115, Worker's Blocking Tags (WBTs)

- A. May also contain Yellow Permissive Tags (YPTs) on the Work Clearance Document (WCD).
- B. May have more than one simultaneously installed on the same blocking point.
- C. The label designating the Worker and Job Technician is placed on the tag by the Clearing Agent.
- D. May be used to isolate a high voltage energy source (>600 volts).

2019 NRC Written Examination

Question: RO #71

Given:

- A plant startup is in progress.

When:

- The 'A' RPS Motor-Generator Voltage Regulator fails causing generator output voltage to lower to approximately 100VAC.

Which of the following describes the effect of this condition on the Main Steam Line (MSL) Radiation Monitors?

- A. The reduced voltage causes a DOWNSCALE trip of MSL Radiation Monitors RE-N006A and RE-N006B.
- B. Power is lost to MSL Radiation Monitors RE-N006A and RE-N006B, resulting in an INOP trip.
- C. The reduced voltage causes a DOWNSCALE trip of MSL Radiation Monitors RE-N006A and RE-N006C.
- D. Power is lost to MSL Radiation Monitors RE-N006A and RE-N006C, resulting in an INOP trip.

2019 NRC Written Examination

Question: RO #72

Given:

- A RWCU system valve independent verification is being completed in the field.

When:

- The on-duty NCO discovers that two valves on the verification list are in the "A" RWCU pump room.
- The shift radiation protection technician and the independent verifier reviewed the Radiation Work Permit (RWP) survey for the "A" RWCU pump room.
- The general area dose rate at the valves is 115 mRem/hr.
- The job is estimated to take six minutes.

What is the estimated dose the verifier will receive and will the "Hands On" independent verification be required IAW OP-AA-108-101-1002, Component Configuration Control?

- A. 19 mRem; independent verification is NOT required.
- B. 12 mRem; independent verification is required.
- C. 12 mRem; independent verification is NOT required.
- D. 19 mRem; independent verification is required.



2019 NRC Written Examination

Question: RO #73

Given:

- The plant is operating at 100% rated power.

Then:

- A Feedwater Level Control malfunction results in lowering reactor water level.
- Reactor water level reaches +10".
- A full Reactor Recirculation Pump Runback occurs.
- NO other automatic system response occurs.

What are the required Reactor Operator actions for these conditions?

- A. Do NOT insert a manual reactor scram until the Feedwater failure has been verified by two separate individuals with the crew entering HC.OP-AB.ZZ-0000, Reactor Scram.
- B. Inform the Control Room Supervisor of the condition and insert a manual reactor scram with the crew entering HC.OP-EO.ZZ-0101, RPV Control.
- C. Inform the Control Room Supervisor of the condition and when directed, insert a manual reactor scram with the crew entering HC.OP-EO.ZZ-0101, RPV Control.
- D. Perform an immediate pressure reduction to raise reactor water level back to normal as soon as possible with the crew entering HC.OP-AB.RPV-0004, Reactor Level Control.

2019 NRC Written Examination

Question:

RO #74

## 2019 NRC Written Examination

You are the Primary Communicator (CM1) when an Unusual Event (UE) is declared.

Which one of the following are the communication time limits required IAW the ECG ATT.6, Primary Communicators Log (CM1) for New Jersey (NJ), Delaware (DE), and the Nuclear Regulatory Commission (NRC)?

- A. Notify NJ and DE within 15 minutes, and the NRC within 60 minutes of the event CLASSIFICATION.
- B. Notify NJ and DE within 15 minutes, and the NRC within 90 minutes of the event OCCURRENCE.
- C. Notify NJ and DE within 15 minutes, and the NRC within 60 minutes of the event OCCURRENCE.
- D. Notify NJ and DE within 15 minutes, and the NRC within 90 minutes of the event CLASSIFICATION.

PSEG Confidential

**ATTACHMENT 6  
PRIMARY COMMUNICATOR LOG**

EP-HC-325-F6  
ATT 6  
Page 5 of 12

**NOTE**

IF **Step 15.a** is NOT SUCCESSFULLY COMPLETED, then **PERFORM Steps 15. b-d**, below.  
 IF **Step 15.a** is SUCCESSFULLY COMPLETED, then **PROCEED** to **Step 15.e** - Delaware.

CM1/TSC1/EOF1

TIME LIMIT - 15 minutes		INITIAL NOTIFICATIONS			TERMINATION OF EVENT
Step	ORGANIZATION / INDIVIDUALS	NAME OF CONTACT	TIME/ DATE	CALLER	NAME OF CONTACT/ TIME
<b>Step 15.a.</b>	<b>NEW JERSEY STATE POLICE/OEM</b>  Primary: NETS 5400 Secondary: 609-963-6900, <b>PRESS 1</b> BACKUP: EMRAD (not in TSC)		TIME _____		
			DATE _____		
		Call Back:	TIME _____		
			DATE _____		

<b>Step 15.b</b>	<u>SALEM COUNTY</u> Primary: NETS 5402 Secondary: 856-769-2959		TIME _____ DATE _____		
<b>Step 15.c</b>	<u>CUMBERLAND COUNTY</u> Primary: NETS 5403 Secondary: 856-455-8770		TIME _____ DATE _____		
<b>Step 15.d</b>	<u>U.S. COAST GUARD</u> (Speak Only to Duty Desk) Primary: 215-271-4807 Secondary: 215-271-4940		TIME _____ DATE _____		

**PROCEED immediately to next page for Delaware Communications.**

2019 NRC Written Examination

PSEG Confidential

ATTACHMENT 6  
PRIMARY COMMUNICATOR LOG

EP-HC-325-F6  
ATT 6  
Page 6 of 12

NOTE	
<ul style="list-style-type: none"> <li>IF DEMA has called to report acceptance of emergency responsibilities from Delaware State Police <u>THEN</u> CONTACT DEMA for subsequent Delaware notifications IAW <b>Step 15.h</b>.</li> </ul>	CM1/TSC1/EOF1
<ul style="list-style-type: none"> <li>IF <b>Step 15.e</b> is NOT SUCCESSFULLY COMPLETED, then <b>PERFORM Steps 15. f-g</b>, below. IF <b>Step 15.e</b> is SUCCESSFULLY COMPLETED, then <b>PROCEED</b> to <b>Step 30.a</b> - LAC.</li> </ul>	CM1/TSC1/EOF1

TIME LIMIT - 15 minutes		INITIAL NOTIFICATIONS			TERMINATION OF EVENT
Step	ORGANIZATION / INDIVIDUALS	NAME OF CONTACT	TIME/ DATE	CALLER	NAME OF CONTACT/ TIME
Step 15.e	<b>DELAWARE STATE POLICE / DEMA</b>  Initial contact: : (DE STATE POLICE) Primary: NETS 5406 Secondary: 302-659-2341 Backup: NAWAS		TIME _____		
			DATE _____		
		Call Back:	TIME _____		
			DATE _____		
Step 15.f	<u>NEW CASTLE COUNTY</u> Primary: NETS 5408 Secondary: 302-571-7331		TIME _____		
			DATE _____		
Step 15.g	<u>KENT COUNTY</u> Primary: NETS 5409 Secondary: 302-678-9111		TIME _____		
			DATE _____		

For initial notifications, **PROCEED** immediately to next page for LAC Communications.

NOTE	
<b>Step 15.h</b> is to be used when DEMA calls to report acceptance of emergency responsibilities from Delaware State Police.	
Turnover from Delaware State Police to DEMA is complete. <input type="checkbox"/> Yes <input type="checkbox"/> No	
CM1/TSC1/EOF1	

TIME LIMIT - 15 minutes		INITIAL NOTIFICATIONS			TERMINATION OF EVENT
Step	ORGANIZATION / INDIVIDUALS	NAME OF CONTACT	TIME/ DATE	CALLER	NAME OF CONTACT/ TIME
Step 15.h	<u>Subsequent contact: (DEMA)</u>  Primary: NETS 5407 Secondary: 302-659-2251, -2256 BACKUP: NAWAS		TIME _____		
			DATE _____		
		Call Back:	TIME _____		
			DATE _____		

2019 NRC Written Examination

TIME LIMIT - 60 minutes		INITIAL NOTIFICATIONS			TERMINATION OF EVENT
Step	ORGANIZATION / INDIVIDUALS	NAME OF CONTACT	TIME/ DATE	CALLER	NAME OF CONTACT/ TIME
<b>Step 60.a</b>	<b>NRC OPERATIONS CENTER ICMF</b> Primary:(ENS) 301-816-5100 First back-up: 301-951-0550 Second back-up: 301-415-0550 Third back-up: 301-415-0553 FAX 301-816-5151		_____ TIME _____ DATE		
No time limit for Data Sheet. As soon as practical.	<b>NRC Data Sheet</b> (per above <b>NOTE</b> , not required for initial call to NRC)		_____ TIME _____ DATE		
<b>Step 60.b</b>	<b>INPO</b> Emergency Director (ED) 404-290-3977 Assistant Emergency Director (AED) 404-290-3980		_____ TIME _____ DATE		

2019 NRC Written Examination

Question: RO #75

Given:

- An ATWS with fuel damage has occurred.
- The Emergency Duty Officer (EDO) decides that it is necessary to send someone into the Reactor Building (with Radiation Protection) to individually scram rods.

What is the maximum allowable dose limit that the EDO may authorize for this evolution?

- A. 5 REM
- B. 10 REM
- C. 25 REM
- D. 75 REM

2019 NRC Written Examination

Question: SRO #76

Given:

- The reactor was operating at 100% rated power.

When:

- At 1120, dense smoke starts billowing from the control room ventilation ducts.
- At 1125, due to the dense smoke the SM determines that the plant can no longer be operated from the Main Control Room.
- The CRS orders the evacuation of the Main Control Room.
- At 1130, the reactor is scrammed remotely from the RPS distribution panels.
- At 1150, the SM determines that emergency takeover is successful and control has been established at the Remote Shutdown Panel (RSP).

Which of the following describes how the scram can be verified IAW HC.OP-IO.ZZ-0008, Shutdown from Outside Control Room and how should this event be classified?

- A. RPS Backup Scram Air Solenoids verified de-energized; Site Area Emergency.
- B. RMCS Activity Control Cards; Site Area Emergency.
- C. RPS Backup Scram Air Solenoids verified de-energized; Alert.
- D. RMCS Activity Control Cards; Alert.



2019 NRC Written Examination

Question: SRO #77

Given:

- Hope Creek is operating at 100% rated power.

When:

- An instrument airline in the Turbine Building ruptures.
- The air compressors are unable to keep up with the loss of air.
- Instrument air header pressure is lowering quickly.

What will the Reactor Pressure Vessel (RPV) level control and pressure control strategy be for the loss of Instrument Air?

- A. IAW EOP-101 "RPV Control", SRVs for pressure control, HPCI/RCIC for level control.
- B. IAW AB.ZZ-0000 "Reactor SCRAM", Bypass Valves for pressure control, HPCI/RCIC for level control.
- C. IAW EOP-101 "RPV Control", SRVs for pressure control, Maximize CRD for level control.
- D. IAW AB.ZZ-0000 "Reactor SCRAM", Bypass valves for pressure control, Maximize CRD for level control.

2019 NRC Written Examination

Question: SRO #78

Given:

- Shutdown cooling is in service.

T= 12:00

- A complete loss of shutdown cooling occurs.
- RPV temperature is at 148°F.

T= 12:20

- RPV temperature is at 182°F.

Which one of the following describes how the current heat up rate will affect the plant Operational Condition and Technical Specification (TS) heat up limits?

- A. Before T=12:30, a mode change would occur. At T=13:00, the TS heatup rate limit will be exceeded.
- B. After T=12:30, a mode change will occur. At T=13:00, the TS heatup rate limit will be exceeded.
- C. After T=12:30, a mode change will occur. At T=13:00, the TS heatup rate limit will NOT be exceeded.
- D. Before T=12:30, a mode change would occur. At T=13:00, the TS heatup rate limit will NOT be exceeded.

2019 NRC Written Examination

Question: SRO #79

Given:

- The plant is operating at 100% rated power.
- Irradiated fuel is being moved into the spent fuel pool.

When:

- A spent fuel bundle is dropped from the refueling bridge grapple, resulting in a Refuel Floor HVAC Exhaust rad level of  $1.5E-03$   $\mu\text{Ci/ml}$  and steady.

Based on this, the CRS should enter \_\_\_\_\_ and \_\_\_\_\_.

- A. EOP 103/4, "Reactor Building & Rad Release Control" restore rad release rate below ALERT level.
- B. EOP 103/4, "Reactor Building & Rad Release Control" monitor and control reactor building radiation levels, reactor building temperatures, and reactor building floor levels.
- C. HC.OP-AB.CONT-0005, "Irradiated Fuel Damage" return the dropped spent fuel bundle to its original location.
- D. HC.OP-AB.CONT-0005, "Irradiated Fuel Damage" within 60 minutes, implement OP-HC-108-115-1001, Attachment 5, Operability Evaluation Log, to seal secondary containment breaches.

2019 NRC Written Examination

Question: SRO #80

Given:

- The plant is operating at 100% rated power.
- Pressure transmitter BB-PT-N050A has failed its surveillance calibration check.
- The failure is non-conservative.

Which one of the following describes the action(s) required by Technical Specification?

**[Reference attached]**

- A. Commence a normal shutdown within one hour and be in at least Startup within 6 hours, Hot Shutdown with 6 hours and Cold Shutdown within the following 24 hours.
- B. Place the inoperable channel(s) and/or that trip system in the tripped condition within 24 hours.
- C. Place at least one trip system in the tripped condition within one hour and be in at least HOT SHUTDOWN within 12 hours.
- D. Place the inoperable channel(s) and/or that trip system in the tripped condition within 12 hours.

2019 NRC Written Examination

Question: SRO #81

Given:

- The plant was operating at 100% rated power.

When:

- A transient occurs resulting in a Reactor Scram.
- RPV pressure reached 1330 psig before turning downward.

Which one of the following states the required action(s) for RPV steam dome pressure reaching 1330 psig?

- A. Perform an engineering evaluation on the out-of-limits condition within 24 hours.
- B. Restore to within limits within 15 minutes or be in COLD SHUTDOWN within the next 6 hours.
- C. Prepare and submit a Safety Limit Violation Report within 30 days.
- D. Restore to within limits within 1 hour or be in COLD SHUTDOWN within the next 12 hours.

2019 NRC Written Examination

Question: SRO #82

Given:

- The reactor has been in COLD SHUTDOWN for two (2) days following power operation.
- Reactor vessel water level is +30 inches.
- Neither Reactor Recirculation pump is available.
- HC.OP-GP.SM-0001, Defeating NSSSS isolations for Shutdown Cooling, has NOT been completed.
- Alternate decay heat removal using RHR 'D' and 'B' cross-tie has been established IAW HC.OP-AB.RPV-0009, Shutdown Cooling Attachment 3.

Then:

- RPV level lowers to +10".

WHICH ONE of the following describes the status of the 'D' RHR Pump and what are the actions that need to be directed?

The 'D' RHR pump is \_\_ (1) \_\_ and as the CRS direct \_\_ (2) \_\_.

- A. (1) tripped  
(2) isolating the HV-F015B, RHR Loop 'B' Return to Recirc Loop 'B Isolation
- B. (1) running  
(2) immediately securing the 'D' RHR pump
- C. (1) tripped  
(2) isolating the HV-F008 and HV-F009 Shutdown Cooling Isolation valves
- D. (1) running  
(2) throttling the HV-F015B, RHR Loop 'B' Return to Recirc Loop 'B Isolation, to establish flow

2019 NRC Written Examination

Question: SRO #83

Given:

- Reactor power is at 28% rated power.

When:

- An EHC failure raises RPV pressure to 1052 psig.

Current plant conditions:

- The Main Turbine is tripped.
- Mode Switch is locked in the Shut Down position.
- The Scram Air header is at 72 psig.
- There is NO control rod motion.

Which one of the following procedures should be implemented and why?

- A. Enter EOP-101A, "ATWS-RPV Control"; because the SDV (Scram Discharge Volume) is full.
- B. Enter EOP-101, "RPV Control"; because a scram reset is required.
- C. Enter EOP-101, "RPV Control", because the Main Turbine is tripped.
- D. Enter EOP-101A, "ATWS-RPV Control"; because manual ARI (Alternate Rod Insertion) is required.

2019 NRC Written Examination

Question: SRO #84

Given:

- The reactor is shutdown (all rods full-in) due to a scram on low RPV level.
- All sources of injection to the RPV have been lost.
- Water level is slowly lowering due to decay heat boil off.
- Reactor pressure is stable and being controlled by SRVs.
  
- All efforts to restore a source of injection have been unsuccessful.

As RPV water level goes below level 1 and continues to lower, describe the next operator action(s).

- A. When RPV water level reaches the Minimum Zero-Injection Water Level (MZIRWL), open 5 ADS valves.
- B. When RPV water level reaches Minimum Steam Cooling Reactor Water Level (MSCRWL), open 5 ADS valves.
- C. When RPV water level reaches Top of Active Fuel (TAF), open turbine bypass valves.
- D. Immediately open 5 ADS valves, and enter Severe Accident Guidelines (SAG).



2019 NRC Written Examination

Question: SRO #85

Given:

- The plant is operating at 100% rated power.

Then:

- The crew reports a MWe drop with no change in recirculation system or rod position.
- SPDS shows rising HPCI room temperatures and a drop in HPCI steam inlet pressure on the 10C650 panel.

The following OHA's are in alarm:

- RADIATION MONITORING ALARM/TRBL C6-C1
- RBVS & WING AREA HVAC PNL 10C382 E6-C5

Secondary Containment d/p is -0.25 inches WG and rising toward 0 inches WG.

The Radiation monitor(s) in alarm is (are) from the \_\_(1)\_, as the CRS direct \_\_(2)\_\_\_.

- A. (1) North Plant Vent and Reactor Building Exhaust,  
(2) isolating HPCI, placing FRVS in service, and enter HC.OP-AB.CONT-0003 "Reactor Building".
- B. (1) South Plant Vent  
(2) placing FRVS in service and enter HC.OP-AB.CONT-0004 – "Radioactive Gaseous Release".
- C. (1) South Plant Vent and Reactor Building Exhaust,  
(2) isolating HPCI, placing FRVS in service, and enter HC.OP-AB.CONT-0003 "Reactor Building" and HC.OP-AB.CONT-0004 – "Radioactive Gaseous Release".
- D. (1) North Plant Vent,  
(2) placing FRVS in service and enter HC.OP-AB.CONT-0004 – "Radioactive Gaseous Release".

2019 NRC Written Examination

Question: SRO #86

Given:

- RHR 'A' pump is operating at 10,450 gpm in "full flow test" mode.

During the test, a LOCA occurs and a valid LPCI initiation signal is generated concurrent with a loss of offsite power.

- The PO reports HPCI and RCIC both fail to start.
- The RO reports the "A" and "B" Emergency Diesel Generators are not able to energize their respective buses due to generator lockouts.
- RPV water level is -129" and lowering.
- Reactor Pressure is at 400 psig and lowering.

All applicable Emergency Operating Procedure actions are taken.

LPCI injection valves (F017's) \_\_\_\_ (1) \_\_\_\_ will be open. Once Emergency Depressurization occurs, EOPs require RPV water level band to be restored and maintained between \_\_\_\_ (2) \_\_\_\_.

- A. (1) 'C' and 'D'  
(2) -38" to +54"
- B. (1) 'A', 'B', 'C', and 'D'  
(2) -38" to +54"
- C. (1) 'C' and 'D'  
(2) -185" to +54"
- D. (1) 'A', 'C', and 'D'  
(2) +12.5" to +54"

2019 NRC Written Examination

Question: SRO #87

Given:

- A complete core offload was completed at the beginning of the refueling outage.
- Fuel reload is ready to commence.
- All SRM's are fully inserted with the following count rates:
  - 'A' – 5 cps
  - 'B' – 2 cps
  - 'C' – 6 cps
  - 'D' – 1 cps

Based on these conditions, which of the following actions is required IAW plant procedure?

- A. Spiral fuel reload may commence in 'A' and 'C' quadrants only, until either 'B' or 'D' quadrant SRM is reading > 3 cps at which time complete reload may be commenced.
- B. A movable SRM detector must be hooked up to the normal SRM channel instrumentation and be placed in either 'B' or 'D' quadrant, indicating > 3 CPS prior to Spiral fuel reload commencement.
- C. Spiral fuel reload may commence up to the first 16 bundles, at which time all four SRM's must read > 3 cps to perform a complete reload.
- D. Spiral Reload may commence with no restrictions as long as any two SRM's are reading > 3 cps.

2019 NRC Written Examination

Question: SRO #88

Given:

- The plant is operating at 100% rated power.
- With no rods selected on the rod display, the following alarm is received:
  - LPRM UPSCALE (C3-D5)
- The operator confirms that one LPRM is upscale as shown on the PPC OD-8 (Plant Process Computer).

What subsequent action will have to be taken IAW HC.OP-AB.IC-0004, Neutron Monitoring, after bypassing the failed LPRM and what is the requirement for APRM operability?

- A. Direct the reactor engineer to evaluate the failed LPRM.  
APRM operability requires a minimum of 4 LPRMs per level.
- B. Reset the tripped RPS channel.  
APRM operability requires a minimum of 3 LPRMs per level.
- C. Reset the tripped RPS channel.  
APRM operability requires a minimum of 4 LPRMs per level.
- D. Direct the reactor engineer to evaluate the failed LPRM.  
APRM operability requires a minimum of 3 LPRMs per level.

2019 NRC Written Examination

Question: SRO #89

Given:

- The plant is at 85% rated power.

Then:

- The DC supply breaker to the AD481 Inverter (72-41022) trips open due to undervoltage.

(1) Which procedure provides the required actions to mitigate this plant condition?

(2) What Technical Specification action(s), if any, is (are) required?

**[Reference attached]**

- A. (1) HC.OP-SO.PK-0001(Q), 125 VDC Electrical Distribution System Operation.  
(2) Enter a tracking LCO. No Technical Specification LCO entry is required because the backup power source is still available to supply power to the distribution panel.
- B. (1) HC.OP-SO.PK-0001(Q), 125 VDC Electrical Distribution System Operation.  
(2) Be in Cold Shutdown within 44 hours of the time breaker 72-41022 was opened, if the associated inverter cannot be made Operable.
- C. (1) HC.OP-AB.ZZ-0136(Q), Loss of 120 VAC Inverter.  
(2) The associated inverter must be made Operable within 7 days to prevent additional required actions.
- D. (1) HC.OP-AB.ZZ-0136(Q), Loss of 120 VAC Inverter.  
(2) The associated 120 VAC distribution panel must be made Operable within 8 hours to prevent additional required actions.

2019 NRC Written Examination

Question: SRO #90

Given:

- The plant was at 100% rated power when a Station Blackout occurred.
- Reactor scrammed, all control rods at 00.
- HPCI initiated and immediately tripped.
- RCIC is injecting.
- 1 SRV has not reseated and is partially open.

10 minutes later, conditions are as follows:

- Reactor pressure 650 psig and stable
- Reactor level -170 inches and lowering 1 inch/min
- Drywell pressure 1.5 psig rising slowly
- Drywell temperature 190°F rising slowly
- Suppression pool level 80 inches
- Suppression chamber temp 140°F
- Suppression pool temp 190°F
- All SRVs are capable of being opened

Based on the above conditions, what is the next required action?

- A. Perform Emergency RPV Depressurization immediately.
- B. When RPV level drops to -198 inches, perform Emergency RPV Depressurization.
- C. Perform Rapid RPV Depressurization immediately.
- D. When RPV level drops to -185 inches, perform Rapid RPV Depressurization.

2019 NRC Written Examination

Question: SRO #91

Given:

- A reactor startup is in progress.
- Reactor pressure is at 750 psig.
- Control rod withdrawal is in progress.
- CRD Hydraulic system parameters are all normal.

When:

- A withdrawn control rod receives an accumulator alarm due to nitrogen pressure.
- The NEO reports from the field that the accumulator nitrogen pressure is at 750 psig.

Which of the following describes when a reactor scram would be required?

- A. When two accumulators are determined to be inoperable.
- B. When the accumulator alarm is verified to be valid.
- C. If the charging water header pressure was to lower below 940 psig.
- D. If the control rod is NOT inserted within one hour.

2019 NRC Written Examination

Question: SRO #92

Given:

- The plant is at 10% rated power:
- 'B' RHR is in Suppression Pool Cooling
- HPCI in Full Flow test IAW HC.OP-IS.BJ-0001, HPCI Main and Booster Pump Set.

When:

- A complete loss of the AD483 (AJ483) inverter output occurs causing a loss of all RPIS (Rod Position Information System) indications.

Then:

- A Loss of Offsite Power occurs.
- NO operator actions have been taken.

Current plant conditions:

- The MSIVs are closed.
- Reactor Power: <1%.
- Reactor Pressure: 1040 psig and rising 1 psig every 2 minutes.
- SRV Lo-Lo Set is NOT armed.
- Reactor Level: 15" and lowering 1" every 2 minutes.
- NO systems are injecting to the RPV.
- Suppression Pool temperature: 96°F and rising 1°F every 2 minutes.
- Suppression Pool level: 79" and rising 1" every 5 minutes.

Which of the following actions are required to be directed for these conditions IAW plant procedures?

- A. Commence a Cooldown at less than 100°F per hour and restore Suppression Pool Level to between 74.5" and 78.5" with 'B' RHR letdown to Radwaste.
- B. Stabilize RPV pressure below 1037psig and maintain RPV level between +54" and -185".
- C. Depressurize the reactor at a cooldown rate of 100°F per hour and initiate SLC before Suppression Pool temperature reaches 140°F.
- D. Lower RPV level to between -50" and -185" and initiate SLC before Suppression Pool temperature reaches 110°F.



2019 NRC Written Examination

Question: SRO #93

Given:

- The plant is at 100% rated power.

When :

- OHA C6-C1, "RADIATION MONITORING ALARM/TRBL", is received.

The NCO Observes the following condition:

- SPV channel 9RX581 (High Range Monitor) has a check source test failure alarm on the RM-11.

Then:

- The NCO initiates a second check source test for SPV channel 9RX581 (High Range Noble Gas Monitor).

Resulting in:

- Failure of the second source check as indicated on the RM-11.
- All other channels have normal indication.

Assuming releases through the South Plant Vent are to continue, then \_\_\_\_\_.

**[Reference attached]**

- obtain noble gas samples at least once per 12 hours.
- estimate SPV flow rate at least once per 4 hours, obtain noble gas samples at least once per 12 hours, and establish an alternate method for sampling.
- either restore to OPERABLE status within 72 hours or establish a preplanned alternate method for monitoring AND prepare and submit a Special Report to the NRC within 14 days.
- estimate SPV flow rate at least once per 4 hours, obtain noble gas samples at least once per 12 hours, establish an alternate method for sampling, and either restore to OPERABLE status within 72 hours or prepare and submit a Special Report to the NRC within 14 days.

2019 NRC Written Examination

Question: SRO #94

IAW OP-AA-108-115, 'OPERABILITY DETERMINATIONS & FUNCTIONALITY ASSESSMENTS', the determination of whether systems, structures, or components (SSCs) are operable is the responsibility of \_\_\_\_\_.

- A. ONLY a senior licensed operator on the operating shift crew
- B. ANY senior licensed operator (does not need to be assigned to the operating shift crew)
- C. the Site Engineering Director
- D. the Operations Director

2019 NRC Written Examination

Question: SRO #95

Given:

- While performing a HPCI system lineup check the equipment operator finds that a local Limitorque position indicator for FD-HV-F003, HPCI Outboard Steam Supply Isolation Valve, does not indicate fully open.
- To verify position, he disengages the motor actuator and attempts to open the valve further.
- After manually back seating the valve to ensure that it is fully open, he notes the problem on the system lineup to document the actions taken.
- The valve had not been subsequently operated from the Control room prior to the manual operation.

As the CRS on-shift, what is your evaluation of the Equipment Operator's actions and current valve status?

The actions taken by the Equipment Operator are \_\_\_\_\_ (1) \_\_\_\_\_.

The valve \_\_\_\_\_ (2) \_\_\_\_\_.

- A. (1) in accordance with plant procedures.  
(2) should be considered OPERABLE.
- B. (1) in accordance with plant procedures.  
(2) must be declared INOPERABLE.
- C. (1) NOT in accordance with plant procedures.  
(2) should be considered OPERABLE.
- D. (1) NOT in accordance with plant procedures.  
(2) must be declared INOPERABLE.

2019 NRC Written Examination

Question: SRO #96

The plant is planning to install a new flow control system for HPCI during the next outage.

In accordance with LS-AA-104, "50.59 Review Process," a 10 CFR 50.59 Evaluation would determine if the new flow control system requires \_\_\_\_ (1) \_\_\_\_.

The administrative process to perform initial acceptance testing of HPCI with the new flow control system is controlled by \_\_\_\_ (2) \_\_\_\_.

- A. (1) NRC approval prior to implementation  
(2) OP-AA-108-110, EVALUATION OF SPECIAL TESTS OR EVOLUTIONS
- B. (1) NRC approval prior to implementation  
(2) OP-AA-103-103, OPERATION OF PLANT EQUIPMENT
- C. (1) ONLY NRC notification prior to implementation  
(2) OP-AA-108-110, EVALUATION OF SPECIAL TESTS OR EVOLUTIONS
- D. (1) ONLY NRC notification prior to implementation  
(2) OP-AA-103-103, OPERATION OF PLANT EQUIPMENT

2019 NRC Written Examination

Question: SRO #97

Which of the following is a responsibility of the SM/CRS IAW MA-AA-716-025, Scaffold Installation, Modification, and Removal Request Process?

- A. Ensures prior to startup that there are no scaffolds installed that may adversely affect equipment in Seismic II/I or Safety Related Areas.
- B. Evaluates, approves or rejects any scaffold specific deviations requested for scaffold erection.
- C. Takes corrective action on deficient scaffolding for removal or modification as required.
- D. Enters the appropriate information into the Scaffold Log, including identifying scaffold considered to be a missile hazard.

2019 NRC Written Examination

Question: SRO #98

Given:

- The reactor was manually scrammed.
- Multiple control rods are stuck full out.
- Main Steam Line Radiation levels reached 3xNFPB and the MSIVs were closed.
- When HPCI was initiated, a steam line break in the HPCI room occurred.
- All efforts to close the HPCI steam line isolation valves have failed.

Current plant conditions:

- Reactor Power is at 3%.
- Reactor water level is at -58" and being maintained with RCIC.
- Reactor pressure 800 psig and steady.
- SLC is injecting and SLC tank level is at 3000 gallons.
- HPCI Room Temperature is at 260°F and rising.
- RCIC Room Temperature is at 110°F and rising.
- All other Reactor Building Room Temperatures are at 90°F and steady.
- Offsite Release Rate on SPDS is at 9.2E+08  $\mu$ Ci/sec.
- No Dose Assessment is available at this time.
- There is visible confirmation of steam coming from the Reactor Building Blowout Panels.

What is (are) the required operator action(s)?

- A. Depressurize the RPV and maintain cooldown rate below 100°F/hr.
- B. Immediately perform a Rapid RPV Depressurization ONLY.
- C. When a second Max Normal Op Temperature is exceeded, then perform an Emergency RPV Depressurization.
- D. Immediately perform an Emergency RPV Depressurization.

2019 NRC Written Examination

Question: SRO #99

Given:

- An event has occurred at the plant.
- The TSC (Technical Support Center) and EOF (Emergency Operations Facility) are manned but NOT activated.

IAW NC.EP-EP.ZZ-0102 "Emergency Coordinator Response", which one of the following describes the individual responsible for escalating an emergency classification level from a SAE (Site Area Emergency) to a GE (General Emergency)?

- A. The Emergency Duty Officer.
- B. The Shift Manager.
- C. The Emergency Response Manager.
- D. The Site Vice President.

2019 NRC Written Examination

Question: SRO #100

During a fire in the Turbine Building, a Fire Brigade Liaison is assigned by the Shift Manager.

Who, by title, can be assigned this role?

- A. MCR/Plant Operator (PO).
- B. Communicator #2 (CM2).
- C. Shift Technical Advisor (STA).
- D. Work Control Supervisor (WCS).