

NRC 2011 RO Exam

1. Which ONE of the following describes the effect, if any, on the neutron error signal to the Control Rod Drive System (CRDS) due to changes in letdown temperature? [assume current neutron error is zero (0)]

If letdown temperature rises the makeup demins will (1) more boron which results in the neutron error signal to the CRDS becoming (2) .

- A. (1) absorb  
(2) positive
- B. (1) absorb  
(2) negative
- C. (1) release  
(2) positive
- D. (1) release  
(2) negative

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2. Which ONE of the following identifies the effect on MUV-16, RCP Seal Injection Control Valve, if a total loss of NNI-X power were to occur?

On a total loss of NNI-X power, \_\_\_(1)\_\_\_ valve control will be lost. Seal injection flow will \_\_\_(2)\_\_\_ .

- A. (1) ONLY automatic  
(2) rise
- B. (1) ONLY automatic  
(2) remain the same
- C. (1) automatic AND manual  
(2) rise
- D. (1) automatic AND manual  
(2) remain the same

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3. Reactor power is at 60% following a dropped rod event. Rod recovery efforts are in progress IAW OP-502, Control Rod Drive System. Prior to withdrawing the control rod RPI is reset to 0.

Which ONE of the following identifies the reason for this action?

This action is necessary to:

- A. extinguish the "Sequence Inhibit" lamp.
- B. clear the "CRD Asymmetric Fault" alarm.
- C. ensure that API and RPI channels agree within the limit specified in the COLR.
- D. restore good data input to the "Rod Withdrawal Insertion Limit" calculation.

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4. At 260° F, HPI (1) required to be de-activated IAW TS 3.4.11, Low Temperature Overpressure Protection (LTOP) System.

In Mode 4, OP-209, Plant Cooldown, de-activates HPI by (2).

- A. (1) is  
(2) opening and RED tagging ALL MUP DC knife switches
- B. (1) is NOT  
(2) opening and RED tagging ALL MUP DC knife switches
- C. (1) is  
(2) selecting the "HPI Valve Emerg Power Sel" switches to "OFF" and RED tagging to remove power from ALL HPI valves
- D. (1) is NOT  
(2) selecting the "HPI Valve Emerg Power Sel" switches to "OFF" and RED tagging to remove power from ALL HPI valves

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5. Which ONE of the following identifies the status of letdown flow following a loss of *all* offsite power (LOOP)? (assume no operator actions)

Letdown flow (1) isolated downstream of the block orifice. This (2) create a release path from letdown to the AB sump.

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

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6. RCS temperature is 180° F when a malfunction occurs. Instrument Air pressure is now 60 psig and lowering.

Manual control of the DHHE DC control valves will be necessary to limit the RCS     (1)     to  $\leq$      (2)     in any 1/2 hour period.

- A.       (1) heatup  
          (2) 50° F
- B.       (1) cooldown  
          (2) 50° F
- C.       (1) heatup  
          (2) 25° F
- D.       (1) cooldown  
          (2) 25° F

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7. With the plant in Mode 1 BWST recirculation with DHP-1A is about to commence.

Which ONE of the following describes how recirculation flow will be controlled?

    (1)     will be used to control recirculation flow. To raise recirculation flow the  
    (2)     will be throttled open until desired flow is reached.

DHV-110      A LPI Flow Control Valve  
DHV-210      DHHE-1A Outlet Isolation/Test Valve

- A.      (1) DHV-110  
          (2) control switch
- B.      (1) DHV-110  
          (2) demand lever
- C.      (1) DHV-210  
          (2) control switch
- D.      (1) DHV-210  
          (2) demand lever

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8. With three (3) RCPs in operation an asymmetric rod runback condition occurs.

IAW Technical Specifications which ONE of the following identifies the maximum power level allowed and the reason for this requirement?

Maximum allowed power level is:

- A. 45% to minimize peaking due to Xenon oscillations.
- B. 60% to minimize peaking due to Xenon oscillations.
- C. 45% to ensure LHR (kw/ft) limitations are not exceeded.
- D. 60% to ensure LHR (kw/ft) limitations are not exceeded.



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9. The following plant conditions exist:

- RCS temperature is 320° F
- RCS pressure is 800 psig

IAW TS 3.5.1, Core Flood Tanks, the core flood tank isolation valves (CFV-5 & 6) must be:

- A. open and energized.
- B. open and de-energized.
- C. closed and energized.
- D. closed and de-energized.

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10. The following plant conditions exist:

- The plant was operating at 60% power when a reactor trip occurred.
- The Immediate Actions of EOP-02, Vital System Status Verification, are in progress.
- Two control rods in Group 6 have failed to fully insert into the core.
- NI power indicates 3% and lowering.

Which ONE of the following identifies the actions to be taken and the reason for the action?

- A. Immediately commence an RCS boration to ensure that shutdown margin is adequate.
- B. Continue with actions in the EOP; commence an RCS boration when directed by the procedure to ensure shutdown margin is adequate.
- C. Immediately commence an RCS boration to counteract the positive reactivity addition from the lower RCS temperature.
- D. Continue with actions in the EOP; no additional actions required for two stuck control rods.

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11. IAW OP-305, Operation of the PZR, which ONE of the following methods will be used to *initially* form a steam bubble in the PZR?
- A. PZR level will be maintained between 60" and 125"; then heated to saturation temperature while venting to the MUT.
  - B. PZR level will be maintained between 60" and 125"; then heated to saturation temperature while venting to the RCDT.
  - C. The PZR will be filled (water solid); then heated to saturation temperature while letdown flow is raised.
  - D. The PZR will be filled to approximately 290"; then heated to saturation temperature while letdown flow is raised.

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12. The following plant conditions exist:

- A transient occurs resulting in automatic operation of the PORV.
- Reactor Coolant Drain Tank (RCDT) pressure is 35 psig.

The approximate temperature downstream of the PORV will be (1) and the reason for this value is because this is an (2) thermodynamic process.

- A. (1) 648° F  
(2) isentropic
- B. (1) 648° F  
(2) isenthalpic
- C. (1) 281° F  
(2) isentropic
- D. (1) 281° F  
(2) isenthalpic

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13. The following plant conditions exist:

- The plant is in Mode 1.
- MUP-1B, SWP-1A and RWP-2A are running.
- A malfunction in the 230 KV switchyard caused the Off-site Power Transformer (OPT) feeds from the switchyard (breakers 4900 and 4902) to trip open but the normal feeder breaker (3211) to the ES bus remained closed.

IAW AP-770, Emergency Diesel Generator Actuation, which ONE of the following describes the appropriate operator response, if any, to this situation?

- A. No additional operator actions required.
- B. Trip the reactor and secure SW cooled components.
- C. Align MUP-1A to DC cooling then start DCP-1A and RWP-3A; start MUP-1A.
- D. Start DCP-1B and RWP-3B; align the makeup system to start MUP-1C; start MUP-1C.

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14. The following plant conditions exist:

- RB pressure is 32 psig.
- RCS pressure is 1100 psig.
- Adequate subcooling margin does exist.
- An overcurrent lockout has occurred on breaker 3310 (feeder breaker for the 'B' ES 480V bus).

Which ONE of the following identifies running equipment that will be secured, in addition to RWP-3B, because of these conditions? (assume all components have sequenced on as designed)

- A. RWP-2B ONLY
- B. DHP-1B and RWP-2B
- C. BSP-1B and MUP-1C ONLY
- D. BSP-1B, MUP-1C and DHP-1B

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15. The following plant conditions exist:

- A small break LOCA has occurred.
- Tincore is 428° F.
- RCS pressure is 335 psig.
- Total HPI flow is 185 gpm.

Which ONE of the following is the primary process that will provide core cooling for the conditions above? (**reference provided**)

- A. Reflux boiling
- B. Forced circulation
- C. Natural circulation
- D. LPI / break flow cooling

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16. The plant is at 100% power when the RCS narrow range pressure SASS module output fails low.

Assuming NO operator actions, the PZR spray valve (1) open and the reactor (2) trip.

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



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17. Reactor Building sump recirculation has been established following a large break LOCA.

Which ONE of the following actions, IAW EOP-14, EOP Enclosures, was previously taken to protect the LPI pumps from losing net positive suction head?

- A. "RB Flood Level" was verified to be at least 2.5 feet.
- B. Only one BSP was aligned to take a suction from the RB sump.
- C. The LPI pumps' control valve setpoint was adjusted for RB sump operation.
- D. Only one LPI pump was aligned to take a suction from the RB sump.

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18. The following plant conditions exist:

- The plant is at 100% power.
- RC-1-LT1 is selected for PZR level control.
- RC-1-LT3 is failing low at a rate of 40" per minute.

Which ONE of the following describes the PZR level annunciator alarm(s) and PZR heater response for this condition five (5) minutes after the failure?

In addition to a SASS Mismatch alarm:

- A. ONLY the "Low-Low" PZR level annunciator will alarm and heater banks "A" and "D" will de-energize.
- B. ONLY the "Low-Low" PZR level annunciator will alarm and heater banks "B", "C" and "E" will de-energize.
- C. BOTH the "Low" and "Low-Low" PZR level annunciators will alarm and heater banks "A" and "D" will de-energize.
- D. BOTH the "Low" and "Low-Low" PZR level annunciators will alarm and heater banks "B", "C" and "E" will de-energize.

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19. The following plant conditions exist:

- A plant shutdown is in progress.
- Current reactor power is 38%.
- ONLY RPS Channel A & C Turbine Trip Bypass bistables are bypassed.

For the conditions above, an AMSAC actuation (1) occur. IF a turbine trip were to occur the reactor (2) trip.

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

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20. The following plant conditions exist:

- Plant is at 100% power.
- RC-3A-PT4 (RCS pressure transmitter to ES Channel 2) has failed mid-scale.

Three minutes later BS-27-PS (4# RB pressure switch to ES Channel 1, "B" Train) fails to the tripped condition.

Which ONE of the following identifies the "B" ES Train system response to the above failures, if any?

- A. No actuation will occur.
- B. ONLY a HPI actuation will occur.
- C. ONLY a HPI and LPI actuation will occur.
- D. HPI, LPI and RBIC actuation will occur.

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21. The following information is available from the CRD PI panel for Absolute Position Indication (API) and Relative Position Indication (RPI).

Control Rod	RPI (PI Panel)	API (PI Panel)
7-1	92	93
7-2	93	92
7-3	85	86
7-4	93	93
7-5	94	94
7-6	92	92
7-7	92	92
7-8	92	92

Which ONE of the following identifies the expected indications based on the above control rod position information?

- A. PI panel - Individual Fault Light OFF  
Diamond Control panel - Asymmetric Fault Light OFF
- B. PI panel - Individual Fault Light OFF  
Diamond Control panel - Asymmetric Fault Light ON
- C. PI panel - Individual Fault Light ON  
Diamond Control panel - Asymmetric Fault Light OFF
- D. PI panel - Individual Fault Light ON  
Diamond Control panel - Asymmetric Fault Light ON

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22. The following plant conditions exist:

- The plant is at 32% power.
- Annunciator window K-6-1, RCS  $\Delta T_c$  High, is in alarm from Event Point (EP) 1370.
- EP 1370 indicates that "A" Loop  $T_c$  is hotter than "B" Loop  $T_c$ .

This alarm would be caused by a loss of the     (1)     RCP. Continued operation with these conditions will cause     (2)     concerns.

- A.       (1)    "B"  
          (2)    QPT
- B.       (1)    "C"  
          (2)    QPT
- C.       (1)    "B"  
          (2)    axial power imbalance
- D.       (1)    "C"  
          (2)    axial power imbalance

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23. Which ONE of the following actions is necessary to review incore instrumentation history on the Incore Chessel Recorders with the recorder in the normal mode of operation?
- A. Depress and hold red UP or DOWN buttons, as desired.
  - B. Touch and hold the center of the recorder for four seconds and scroll, as desired.
  - C. Touch the Navigator Keypad, followed by the right lower button (Cycle Screen Button).
  - D. Touch the Navigator Keypad, followed by the the right upper button (Area Display button).

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24. The following plant conditions exist:

- Plant is at 100% power.
- MUP-1B is running on the "B" Train.
- RB Main Fan Assembly 1C (AHF-1C) is in operation.

Which ONE of the following identifies the power supply for AHF-1C?

- A. ES MCC 3AB powered from 480V ES Bus 3A
- B. ES MCC 3AB powered from 480V ES Bus 3B
- C. Ventilation MCC 3A powered from 480V Turbine Aux Bus 3A
- D. Ventilation MCC 3B powered from 480V Turbine Aux Bus 3B



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25. A normal plant cooldown is in progress. The "A" decay heat train has just been placed in service. If both trains of decay heat removal are lost at this point, IAW AP-404, Loss of Decay Heat Removal, which ONE of the following identifies the preferred method of core heat removal?

- A. LPI cooling
- B. HPI cooling
- C. CFT cooling
- D. OTSG cooling

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26. The following plant conditions exist:

- A Small Break LOCA has occurred.
- RCS pressure has stabilized at 1450 psig.
- RB pressure is 20 psig and rising.
- The actions of Rule 2, HPI Control, for Bypassing/Resetting ES actuations for the "A" and "B" ES trains are complete.
- The "A" ES train "HPI SEAL IN RESET" pushbutton was also depressed.

Which ONE of the following statements identifies the response of BSP-1A & 1B when RB pressure reaches 30 psig? (assume no other operator actions taken)

- A. BOTH BSP-1A & 1B will NOT auto start.
- B. BOTH BSP-1A & 1B will auto start.
- C. ONLY BSP-1A will auto start.
- D. ONLY BSP-1B will auto start.

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27. Which ONE of the following parameters is controlled to promote the effective removal of iodine in the RB atmosphere following a LOCA?

The (1) of the RB sump is controlled via (2) .

- A.       (1)    pH  
          (2)    staging chemical baskets near the sump
- B.       (1)    boron concentration  
          (2)    staging chemical baskets near the sump
- C.       (1)    pH  
          (2)    batch chemical addition
- D.       (1)    boron concentration  
          (2)    batch chemical addition

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28. The following plant conditions exist:

- Reactor power is 50% RTP.
- Actual RCS pressure is 2055 psig and lowering.
- RCV-14, PZR Spray valve, is open.
- Ultrasonic Flow Indication for the PORV is in the "Valve Open Region".

Which ONE of the following describes a failure that would cause the above plant transient and the correct action(s) to *mitigate* the event?

(RCV-11 = PORV block valve, RCV-13 = PZR spray block valve, RCV-14 = PZR spray valve)

- A.       RCS Narrow Range Pressure transmitter failed high  
          Manually raise PZR heater demand
  
- B.       RCS Narrow Range Pressure transmitter failed high  
          Close RCV-11, RCV-13 and RCV-14
  
- C.       RCS Wide Range Pressure transmitter failed high  
          Manually raise PZR heater demand
  
- D.       RCS Wide Range Pressure transmitter failed high  
          Close RCV-11, RCV-13 and RCV-14

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29. The following plant conditions exist:

- Plant is at 100% power.
- The temperature element for the selected PZR level transmitter fails mid-scale with NO SASS transfer.

Which ONE of the following describes the effect this malfunction will have on MUV-31 (PZR Level Control valve) operation? (Assume NO operator actions are performed.)

MUV-31 will throttle in the (1) direction. The reactor (2) trip on high/low RCS pressure.

- A. (1) open  
(2) will
- B. (1) open  
(2) will NOT
- C. (1) closed  
(2) will
- D. (1) closed  
(2) will NOT

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30. With the plant at full power an RCS pressure excursion is in progress. Three RPS channels have failed to actuate. As RCS pressure rises which ONE of the following describes how DSS (Diverse Scram System) will shut down the reactor?

DSS will open contacts in series with the \_\_\_(1)\_\_\_ to insert all \_\_\_(2)\_\_\_ rods.

- A. (1) "E" and "F" electronic trip contacts  
(2) safety
- B. (1) "E" and "F" electronic trip contacts  
(2) regulating
- C. (1) DC hold bus which will de-energize the "A" and "CC" phases  
(2) safety
- D. (1) DC hold bus which will de-energize the "A" and "CC" phases  
(2) regulating

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31. The following plant conditions exist:

- Plant is in Mode 5 with an RB purge in progress.
- Both purge supply fans (AHF-6A/6B) and both purge exhaust fans (AHF-7A/7B) are in operation.

Which ONE of the following identifies the status of AHF-6A/6B and AHV-1C (purge supply valve inside RB) if AHF-7A trips?

Both supply fans:

- A. remain operating and AHV-1C remains open.
- B. remain operating and AHV-1C closes.
- C. trip and AHV-1C remains open.
- D. trip and AHV-1C closes.

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32. A plant *shutdown* is in progress with current reactor power at 7%.

Which ONE of the following describes the impact to the Source Range NI's high voltage power supplies if power was lost to RPS Channel D?

Both high voltage power supplies would be:

- A. de-energized because NI-7's power is too high.
- B. de-energized because NI-3's power (amps) is too high.
- C. energized because NI-8 would be indicating 0% power.
- D. energized because NI-4 would be indicating 0% power (amps).



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33. Due to a Fuel Move Sheet error fuel assembly #2 has just been placed adjacent to (side-by-side) fuel assembly #1 in Spent Fuel Pool A. **(reference provided)**

<u>Assembly</u>	<u>Enrichment (%)</u>	<u>Burnup (MWD/KgU)</u>
#1	3.5	3.0
#2	3.75	1.0

This fuel assembly movement (1) violate TS 3.7.15, Spent Fuel Assembly Storage. The required actions to be taken are to (2).

- A. (1) does
- (2) immediately initiate action to move fuel assembly #2 to an acceptable location per TS 3.7.15
- B. (1) does
- (2) verify SF pool boron concentration within one (1) hour and contact reactor engineering per TS 3.7.15
- C. (1) does NOT
- (2) immediately initiate action to develop a recovery plan to move fuel assembly #2 to an acceptable location per FP-203, Offloading and Refueling Operations
- D. (1) does NOT
- (2) verify SF pool boron concentration and contact reactor engineering per FP-203, Offloading and Refueling Operations

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34. The following plant conditions exist:

- "A" OTSG has a large tube rupture.
- EOP-06, Steam Generator Tube Rupture, is in progress.
- A Tube Rupture Alternate Control (TRACC) limit has been exceeded (BWST level  $\leq$  35 feet)

Which ONE of the following describes criteria that must be satisfied prior to isolating the ruptured OTSG (IAW TRACC) and the basis for the requirement(s)?

- A. RCS temperature and pressure must be  $\leq 500^\circ$  F and  $\leq 1000$  psig before OTSG isolation to ensure the RCS is subcooled below the ruptured OTSG MSSV lift setpoint.
- B. Adequate SCM must be adjusted to the applicable target value before OTSG isolation to ensure adequate SCM at an RCS pressure below the ruptured OTSG MSSV lift setpoint.
- C. RCS temperature and pressure must be  $\leq 500^\circ$  F and  $\leq 1000$  psig before OTSG isolation to minimize the pressure differential across the ruptured OTSG tubes.
- D. Adequate SCM must be adjusted to the applicable target value before OTSG isolation to minimize the pressure differential across the ruptured OTSG tubes.

35.



Based on the above indications TS 3.4.12, RCS Operational Leakage, (1) be entered and (2) will be used to mitigate the consequences of the event. Assume the plant is at 100% power with ARP-1B running by itself. **(reference provided)**

- A. (1) will  
(2) EOP-06, Steam Generator Tube Rupture,
- B. (1) will  
(2) CP-152, Primary to Secondary Leakage Operating Guideline,
- C. (1) will NOT  
(2) EOP-06, Steam Generator Tube Rupture,
- D. (1) will NOT  
(2) CP-152, Primary to Secondary Leakage Operating Guideline,

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36. A steam line rupture inside containment has occurred.

Which ONE of the following sets of instruments will provide the most reliable *post accident* information?

- A. Wide range RCS pressure and wide range containment pressure instruments.
- B. Wide range RCS pressure and narrow range containment pressure instruments.
- C. Narrow range RCS pressure and wide range containment pressure instruments.
- D. Narrow range RCS pressure and narrow range containment pressure instruments.

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37. During a plant start-up the following conditions exist:

- Turbine header pressure is 870 psig and rising slowly.
- Turbine is at sync speed with no output breakers closed.
- All turbine bypass valves are closed.

If turbine header pressure continues to rise which ONE of the following values will be the earliest pressure that the turbine bypass valves will begin to open?

- A. 885 psig
- B. 895 psig
- C. 935 psig
- D. 1010 psig

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38. IAW EOP-02, Vital System Status Verification, which ONE of the following identifies the action(s) required to be performed if Breaker 1661 (generator output breaker) still remains closed after attempting to trip the breaker with the backup trip coil?
- A. Open MOS 1661N and MOS 1661S to isolate Breaker 1661.
  - B. Notify the System Dispatcher to separate CR-3 from the grid.
  - C. Open the generator field breaker and select the voltage regulator to OFF.
  - D. Open MOS 1873 (motor operated switch between main generator output and Breakers 1661 and 1662).

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39. Which ONE of the following sets of valves, if opened, will establish a proper HPI flowpath for a loss of all feedwater IAW EOP-04, Inadequate Heat Transfer?

1. MUV-23 (HPI Injection valve to A RCP discharge)
2. MUV-24 (HPI Injection valve to B RCP discharge)
3. MUV-25 (HPI Injection valve to C RCP discharge)
4. MUV-26 (HPI Injection valve to D RCP discharge)
5. MUV-586 (HPI Crosstie valve)
6. MUV-587 (HPI Crosstie valve)

- A. 1, 2 and either 5 or 6
- B. 1, 3 and either 5 or 6
- C. 1, 2, 5 and 6
- D. 1, 4, 5 and 6

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40. The 1E (safety related) batteries are required to meet their (1) hour coping requirement if a (2) were to occur.

- A.       (1) 2  
          (2) Station Blackout
  
- B.       (1) 2  
          (2) Design Basis Accident, concurrent with a simultaneous loss of  
              offsite power and start failure of the associated diesel generator,
  
- C.       (1) 4  
          (2) Station Blackout
  
- D.       (1) 4  
          (2) Design Basis Accident, concurrent with a simultaneous loss of  
              offsite power and start failure of the associated diesel generator,



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41. The plant was operating at 100% when a loss of all offsite power occurs. Ten (10) minutes after the trip Tcold is  $\approx 542^\circ\text{F}$  and rising.

RCS Tcold (1) trending towards OTSG saturation temperature. Opening the (2) further will enhance/establish heat removal.

- A. (1) is  
(2) TBVs
- B. (1) is  
(2) ADVs
- C. (1) is NOT  
(2) TBVs
- D. (1) is NOT  
(2) ADVs

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42. A plant shutdown is in progress when the following sequence of events occur.

- 0800 Plant enters Mode 3
- 0805 A loss of all offsite power (LOOP) occurs
- 0808 DPDP-1B is de-energized due to an internal fault on the bus

Which ONE of the following describes the EFIC system response and the actions required to mitigate the effects of these failures?

EFIC will automatically actuate FIRST due to (1) and the (2) EFW Train block valves will need to be closed to prevent excessively feeding both OTSGs.

- A. (1) the loss of all RCPs  
(2) "A"
- B. (1) the loss of all RCPs  
(2) "B"
- C. (1) an OTSG low level condition  
(2) "A"
- D. (1) an OTSG low level condition  
(2) "B"

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43. The following plant conditions exist:

- The plant is at 48% power due to the loss of the "A" MFWP.
- Actions of AP-545, Plant Runback, have been completed.
- The "A" MFWP has now been repaired and the RO has just raised the pump to minimum speed.

Which ONE of the following identifies the status of the MFW components below if a "B" OTSG MFLI now occurs?

"A" MFWP, "A" Main Feedwater Pump  
FWV-36, "A" Startup BlockValve

- |    |                    |                   |
|----|--------------------|-------------------|
| A. | "A" MFWP<br>FWV-36 | tripped<br>open   |
| B. | "A" MFWP<br>FWV-36 | tripped<br>closed |
| C. | "A" MFWP<br>FWV-36 | running<br>open   |
| D. | "A" MFWP<br>FWV-36 | running<br>closed |

NRC 2011 RO Exam

44. DPDP-1A has experienced a catastrophic failure and power is lost to the DC buses it supplies.

1. EFV-32 EFP-2 block valve to the "B" OTSG
2. EFV-33 EFP-3 block valve to the "B" OTSG
3. EFV-55 EFP-2 control valve to the "B" OTSG
4. EFV-57 EFP-3 control valve to the "B" OTSG

Which ONE of the following identifies the components that will lose power as a result of this failure?

- A. 1 and 2
- B. 2 and 3
- C. 3 and 4
- D. 1 and 4

NRC 2011 RO Exam

45. With the plant in Mode 2 which ONE of the following describes the status of the RW system after a loss of *all* offsite power has occurred? (assume sufficient time for all automatic actions to occur)
- A. As soon as power is restored to the ES 4160V buses RWP-2A will start due to RW system low pressure.
  - B. As soon as power is restored to the ES 4160V buses RWP-2B will start due to RW system low pressure.
  - C. The automatic start on low RW pressure is blocked by the 4160V undervoltage lockout. No RWPs will be running.
  - D. The automatic start on low RW pressure is blocked by EDG output breaker closure. No RWPs will be running.

NRC 2011 RO Exam

46. The following plant conditions exist:

- A plant startup is in progress with the Startup Transformer supplying both Unit Buses.
- A sudden pressure fault has just occurred on the Backup ES (BEST) transformer.
- No emergency diesel generators (EDGs) start.

Which ONE of the following identifies the battery chargers that will lose power as a result of these failures?

- A. "A" Train 1E (vital) battery chargers ONLY.
- B. "B" Train 1E (vital) battery chargers ONLY.
- C. "A" Train 1E (vital) battery chargers and the spare Non-1E (non-vital) battery charger (DPBC-1I).
- D. "B" Train 1E (vital) battery chargers and the spare Non-1E (non-vital) battery charger (DPBC-1I).

NRC 2011 RO Exam

47. The following plant conditions exist:

- A plant startup is in progress with all reactor coolant pumps (RCP) running.
- All DC power is lost to 6900 VAC Reactor Auxiliary Bus 3A.
- 10 seconds later AC power to the same bus is lost.

Which ONE of the following describes the response of RCP-1A and 1C if AC power is restored to the bus?

RCP-1A and 1C breakers:

- A. remain closed and the RCPs will start.
- B. tripped when AC power was lost and the pumps will NOT restart.
- C. remain closed but will trip when AC power is restored.
- D. tripped when DC power was lost and the pumps will NOT restart.

NRC 2011 RO Exam

48. Which ONE of the following describes how aligning the spare battery charger to BOTH battery banks at the same time is prevented?
- A. A selector switch only allows the selection of one feeder breaker at a time.
  - B. An electrical interlock prevents closing both feeder breakers simultaneously.
  - C. A *keyless* mechanical interlock prevents closing both feeder breakers simultaneously.
  - D. A *keyed* mechanical interlock prevents closing both feeder breakers simultaneously.



NRC 2011 RO Exam

49. The "B" Emergency Diesel Generator is running supplying its associated 4160V ES bus in parallel with the grid for surveillance testing. A grid disturbance occurs and the following EDG indications are noted:



IAW SP-354B, Monthly Functional Test of the EDG, (1) loading is NOT acceptable. The (2) will be used to return EDG loading back to acceptable values.

- A. (1) megavar  
(2) "EDG B Speed" switch
- B. (1) kilowatt  
(2) "EDG B Speed" switch
- C. (1) megavar  
(2) "EDG B EXC Volt Adjust" rheostat
- D. (1) kilowatt  
(2) "EDG B EXC Volt Adjust" rheostat

NRC 2011 RO Exam

50. The following plant conditions exist:

- RCS temperature is 212° F.
- The diesel fuel oil storage tank readings are as follows:

EDG "A" - 7' 1"

EDG "B" - 6' 6"

Which ONE of the following identifies the required TS action(s) for these conditions? (**reference provided**)

- A. Restore fuel oil to within limits in 48 hours.
- B. Immediately declare BOTH EDGs inoperable.
- C. Immediately declare ONLY the "B" EDG inoperable.
- D. Verify combined stored fuel oil level > 45,834 gallons within 1 hour.

NRC 2011 RO Exam

51. Annunciator window G-2-1, Instrument Air Press Low, has just come into alarm due to a leak in the IA header.

Based on the above conditions there should be (1) air compressor(s) running.

If air pressure is completely lost to MUV-49 it would fail (2).

- A. (1) ONLY 2  
(2) open
- B. (1) ONLY 2  
(2) closed
- C. (1) 4  
(2) open
- D. (1) 4  
(2) closed

NRC 2011 RO Exam

52. An SDT-1 release to the discharge canal is in progress when RM-L7 fails high.

Which ONE of the following identifies what effect, if any, this malfunction will have on SDP-7 (SDT-1 Recirc Pump) and SDV-90 (RM-L7 Remote Operated Isolation Valve)?

SDP-7 (1) automatically trip and SDV-90 (2) automatically close.

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

NRC 2011 RO Exam

53. The plant is in Mode 4 when maintenance reports that the inner door on the Personnel Hatch Airlock will not seal properly after leaving containment.

IAW Technical Specifications which ONE of the following identifies the action required, if any?

- A. No action required if remaining in Mode 4.
- B. Within 1 hour verify the outer door is closed.
- C. Within 1 hour perform SP-430, Containment Air Locks Seal Leakage Test.
- D. Immediately initiate action to evaluate overall containment leakage rate.

NRC 2011 RO Exam

54. Which ONE of the following represents the effect of depressing the "CHECK SOURCE" button on RM-L2 and the reason for having a check source?

Pressing this button \_\_\_(1)\_\_. A check source is used to \_\_\_(2)\_\_\_.

- A. (1) exposes the detector to a known radioactive substance  
(2) verify proper monitor response
- B. (1) injects an electronic signal downstream of the detector  
(2) verify proper monitor response
- C. (1) exposes the detector to a known radioactive substance  
(2) provide a signal for monitor calibration
- D. (1) injects an electronic signal downstream of the detector  
(2) provide a signal for monitor calibration

NRC 2011 RO Exam

55. Which ONE of the following requires entry into AP-250, Radiation Monitor Actuation?

An Atmospheric Radiation High alarm on \_\_\_\_\_ monitor.

- A. RM-A2 gas
- B. RM-A2 particulate
- C. RM-A12 gas
- D. RM-A12 particulate

NRC 2011 RO Exam

56. The following plant conditions exist:

- The plant is at 100% power with the Unit Buses supplied from the Unit Aux Transformer.
- SP-354B, Monthly Functional Test of EDG-1B, is in progress with EDG-1B paralleled with the grid.
- The Backup ES Transformer (BEST) is lost due to all sudden pressure relays actuating.

Which ONE of the following identifies which Nuclear Services Raw Water (RW) system pumps will be running, if any? (assume sufficient time for all automatic actions to occur)

- A. None
- B. RWP-1, Normal Nuclear Services Sea Water Pump
- C. RWP-2A, Emergency Nuclear Services Sea Water Pump
- D. RWP-2B, Emergency Nuclear Services Sea Water Pump



NRC 2011 RO Exam

57. Which ONE of the following describes the purpose/function of RWV-150, RW Recirc Flow Control Valve?

RWV-150 regulates recirculation flow to the (1) RW pit to maintain (2) temperature limits.

- A. (1) "A"  
(2) SW
- B. (1) "A"  
(2) RW
- C. (1) "B"  
(2) SW
- D. (1) "B"  
(2) RW

NRC 2011 RO Exam

58. A grid disturbance has caused grid voltage to lower. Due to this lower grid voltage CR3's MVAR out loading will (1). In order to *re-zero* the "Voltage Reg Balance" meter the generator (2) switch must be used.

- A. (1) rise  
(2) Volt Adjust
- B. (1) rise  
(2) Base Adjust
- C. (1) lower  
(2) Volt Adjust
- D. (1) lower  
(2) Base Adjust

NRC 2011 RO Exam

59. With the exception of computer displays/annunciator alarms which ONE of the following lists the indication(s) available in the main control room to monitor the plant air systems?
- A. Instrument Air header pressure ONLY
  - B. Station Air and Instrument Air header pressures ONLY
  - C. Instrument Air header pressure and IAV-30, IA/SA Crosstie Auto Isolation, valve position ONLY
  - D. Station Air header pressure, Instrument Air header pressure and IAV-30, IA/SA Crosstie Auto Isolation, valve position

NRC 2011 RO Exam

60. The plant is in Mode 2 when an emergency RB entry is required.

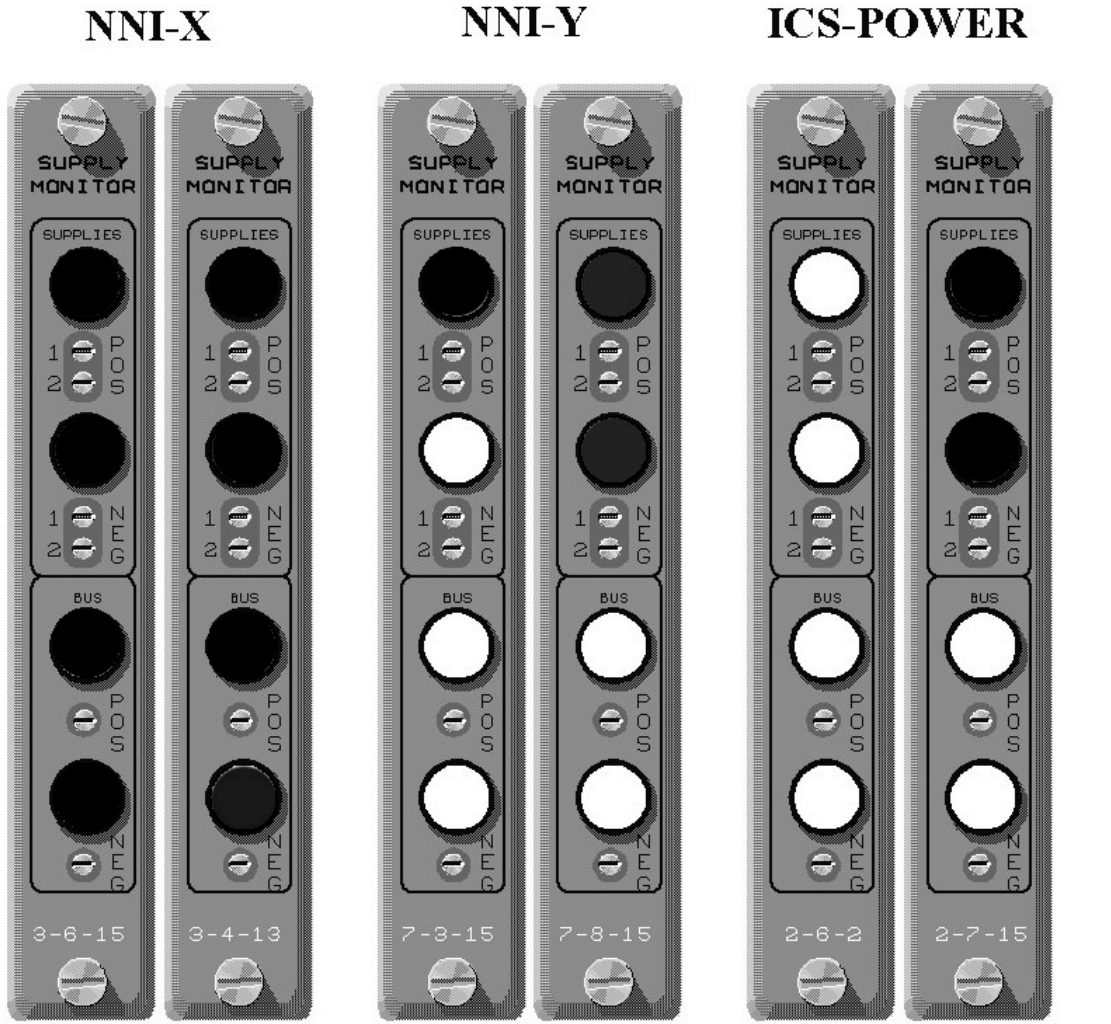
The purpose of the air lock interlock is to prevent (1).

If a reactor trip were to occur while personnel are in containment, IAW OP-417, Containment Operating Procedure, containment evacuation (2) required.

- A.       (1) simultaneous opening of both air lock doors  
          (2) is
- B.       (1) opening an air lock door with excessive differential pressure  
          (2) is
- C.       (1) simultaneous opening of both air lock doors  
          (2) is NOT
- D.       (1) opening an air lock door with excessive differential pressure  
          (2) is NOT

NRC 2011 RO Exam

61. Based on the indications below which ONE of the following will be required to be operated in manual? [White indicates light is ON]



- A. PZR spray valve
- B. MFW pump controllers
- C. Condensate pump controllers
- D. Main Turbine Bypass Valves

NRC 2011 RO Exam

62. The plant is at 70% power with the following activities in progress:

- "A" SCHE shoot and clean activities.
- "B" CWP breaker tripped on overcurrent.

The "A Cond. Pump Pit Sump Level High" alarm has just annunciated in conjunction with the SPO reporting water coming out of the "A" SCHE and that CWV-1, "A" SCHE inlet valve from CWP-1A, has failed open.

*The SPO also reports that water is entering the AB.*

Based on these conditions which ONE of the following identifies the actions required for this event?

IAW AP-1050, Turbine Building Flooding,:

- A. trip the reactor and concurrently perform EOP-02, Vital System Status Verification; then stop all CWPs.
- B. trip the reactor and concurrently perform EOP-02, Vital System Status Verification; then stop CWP-1A ONLY.
- C. reduce power to < 45% IAW AP-510, Rapid Power Reduction; trip the turbine then stop CWP-1A.
- D. reduce power to < 60% IAW AP-510, Rapid Power Reduction; then stop CWP-1A.

NRC 2011 RO Exam

63. The following plant conditions exist:

- The plant was at 100% power when a small break LOCA occurred.
- Rule 1, Loss of SCM, has just been completed.
- Current RCS pressure is 1300 psig and rising.
- Current Tincore indication is 425° F.
- RCS cooldown rate is 65° F per 1/2 hr.

Based on these conditions which ONE of the following describes why Rule 4, PTS, is in effect and why HPI flow must be throttled?

Rule 4, PTS, is in effect because     (1)    . HPI must be throttled to     (2)    .

- A.      (1)    HPI flow exists with no RCPs running  
          (2)    prevent exceeding NDT limits
- B.      (1)    TS cooldown rate was exceeded  
          (2)    prevent exceeding NDT limits
- C.      (1)    HPI flow exists with no RCPs running  
          (2)    lower and maintain RCS pressure below 1000 psig
- D.      (1)    TS cooldown rate was exceeded  
          (2)    lower and maintain RCS pressure below 1000 psig

NRC 2011 RO Exam

64. EOP-04, Inadequate Heat Transfer, has been entered. EFP-2 is the only running EFW pump. Tincore is currently 460° F. You are directed to establish and maintain OTSGs as a heat sink. Step details are as follows:

Lower OTSG PRESS using TBVs (preferred) or ADVs until the higher of the following occurs:

\_\_\_ OTSG PRESS 200 psig (if EFP-2 is only running EFWP)

\_\_\_ OTSG Tsat 40 to 60° F below Tincore

Which ONE of the following identifies the proper OTSG pressure for this situation? (**reference provided**)

- A. 200 psig
- B. 240 psig
- C. 450 psig
- D. 600 psig



NRC 2011 RO Exam

65. Which ONE of the following describes the basis for the maximum cooldown rate limit IAW EOP-09, Natural Circulation Cooldown?

- A. Conserve EFT-2 inventory.
- B. Maintain a stable or lowering core  $\Delta T$ .
- C. Limit thermal stress on the OTSG tubesheet.
- D. Limit voiding in the reactor vessel head region.

NRC 2011 RO Exam

66. The initial power escalation following a refueling outage is being performed. Reactor power level is stabilized to perform testing. The following information is available using the plant computer:

NI-5	26.0%
NI-6	29.0%
NI-7	26.0%
NI-8	29.0%

$T_h$ Loop A	588.5° F
$T_h$ Loop B	588.0° F
$T_c$ Loop A	569.5° F
$T_c$ Loop B	570.0° F

Which ONE of the following identifies the reactor thermal power for the above conditions?

- A. 678 MWth
- B. 717 MWth
- C. 757 MWth
- D. 1049 MWth

NRC 2011 RO Exam

67. EOP-10, Post Trip Stabilization, is in progress when the following indications are observed:

- RCS pressure is 1900 psig and lowering.
- All PZR heaters are on.
- PZR level is 100 inches and stable.
- Makeup Tank level is lowering at a rate of approximately 15 gpm.
- RCDT level and temperature are rising.
- RB sump, temperature and pressure are normal.

This event would be caused by a     (1)     . AP-520, Loss of RCS Coolant or Pressure, will be entered and if the transient can NOT be terminated, then initiate     (2)     within 4 hours.

- A.       (1)    PZR spray valve leakby  
          (2)    EOP-08A, LOCA Cooldown
- B.       (1)    PZR steam space leak  
          (2)    EOP-08A, LOCA Cooldown
- C.       (1)    PZR spray valve leakby  
          (2)    OP-209, Plant Cooldown
- D.       (1)    PZR steam space leak  
          (2)    OP-209, Plant Cooldown

NRC 2011 RO Exam

68. Which ONE of the following identifies the required annunciator response protocol during event procedures?

Alarm response protocol (1) automatically suspended.

If normal alarm response has been suspended due to entry into an event procedure, the OAC (2) direct restoration of normal alarm response protocol.

- A.       (1) is  
          (2) can
- B.       (1) is  
          (2) can NOT
- C.       (1) is NOT  
          (2) can
- D.       (1) is NOT  
          (2) can NOT

NRC 2011 RO Exam

69. At 0800 Tuesday morning, it was discovered that the weekly performance of SP-321, Power Distribution Breaker Alignment and Power Availability Verification, was not performed as scheduled. It was last completed at 2300 on Monday of the prior week.

With respect to work prioritization for the week, which ONE of the following identifies the **LATEST** time that this test can be completed without exceeding an LCO?

- A. Immediately
- B. 2300 on Tuesday
- C. 0800 on Wednesday
- D. 1700 on Wednesday

NRC 2011 RO Exam

70. The following plant conditions exist:

- Plant is operating  $\approx$  20% power.
- SUCV position  $\approx$  95% open.
- LLCV position  $\approx$  5% open.
- 'B' train SUCV and LLCV H/A stations are in HAND for data recording.

Which ONE of the following describes the appropriate actions to return these stations to automatic?

- A. Place the SUCV in auto first, then place the LLCV in auto.
- B. Place the LLCV in auto first, then place the SUCV in auto.
- C. Close the LLCV to allow the SUCV full control. Place the SUCV in auto first and then the LLCV.
- D. Throttle the SUCV to 50% to allow the LLCV full control. Place the LLCV in auto first and then the SUCV.

NRC 2011 RO Exam

71. Due to excessive packing leakage, a motor operated valve (MOV) has been manually backseated using its handwheel.

IAW OPS-NGGC-1000, Fleet Conduct of Operations, the MOV (1) and (2) required to be manually removed from its backseat prior to performing post-maintenance stroke testing.

- A. (1) remains operable  
(2) is
- B. (1) remains operable  
(2) is NOT
- C. (1) must be declared inoperable  
(2) is
- D. (1) must be declared inoperable  
(2) is NOT

NRC 2011 RO Exam

72. The following plant conditions exist:

- The plant is in Mode 5.
- The Reactor Building (RB) Equipment Hatch is off.
- An RB purge is in service.
- High radiation in the RB caused RM-A1 to actuate.
- All purge supply and exhaust fans remain running.

Based on the above conditions, which ONE of the following identifies the procedure and operator actions necessary to terminate an *unmonitored* release from the RB?

- A. IAW AP-250, Radiation Monitor Actuation, stop the purge fans.
- B. IAW AP-250, Radiation Monitor Actuation, Establish Containment Closure.
- C. IAW OP-417, Containment Operating Procedure, stop the purge fans.
- D. IAW OP-417, Containment Operating Procedure, Establish Containment Closure.



NRC 2011 RO Exam

73. You are signed on to a Radiation Work Permit (RWP) that prohibits work in High Radiation areas. While performing a valve lineup you need to enter an area that contains a hot spot where you could receive 300 millirem in an hour at **15** centimeters?

Which ONE of the following describes the entry requirements for this area?

- A. NO entry allowed on this RWP.
- B. Entry allowed with no further restrictions.
- C. Entry allowed with a maximum time limit of 80 minutes.
- D. NO entry allowed on this RWP unless accompanied by an HP technician.

NRC 2011 RO Exam

74. The plant is operating at 70% power when both Reheat Stop Valve, RHV-2 (MSR-3B to LP Turb 3B), and Reheat Intercept Valve, RHV-4 (MSR-3D to LP Turb 3B), close.

Which ONE of the following procedures, if any, is required to be entered for these conditions?

- A. AP-660, Turbine Trip
- B. AP-510, Rapid Power Reduction
- C. EOP-02, Vital System Status Verification
- D. No EOPs/APs are required to be entered at this time.

NRC 2011 RO Exam

75. The following conditions are observed for the "A" Reactor Coolant Pump.

- Reactor Coolant System pressure      2150 psig
- Second stage seal cavity pressure      1100 psig
- Third stage seal cavity pressure      25 psig
- Controlled bleedoff flow      slightly higher
- Seal leakage flow      slightly higher

Which ONE of the following failures would cause the above indications?

- A.      The first stage seal.
- B.      The second stage seal.
- C.      The third stage seal.
- D.      The restriction bushing.

**You have completed the test!**

# 2011 NRC EXAM REFERENCES

08-30-11

## RO

009EK1.01	EOP-03, Figure 2
034A2.03	TS 3.7.15 Figures 1 & 2 ONLY
039A2.03	RM-A12 Conversion Tables (sim version)
064K6.08	TS 3.8.1, 3.8.3 and OP-103F Figure 8
BW/E04EK2.2	EOP-04, Figure 3

## SRO

059G2.1.25	OP-103A Curves 12 & 13
077AG2.2.37	SP-321 Sections 3.0 & 5.0 & Enclosure 7
BW/E05EA2.1	RM-A12 Conversion Tables (sim version, provided with RO references)

R0

1	D	31	D	61	A
2	B	32	A	62	A
3	C	33	A	63	A
4	C	34	A	64	B
5	A	35	B	65	D
6	D	36	A	66	D
7	C	37	B	67	D
8	C	38	B	68	B
9	B	39	C	69	D
10	B	40	C	70	B
11	B	41	B	71	C
12	D	42	B	72	B
13	D	43	A	73	B
14	D	44	D	74	C
15	C	45	D	75	C
16	C	46	D		
17	C	47	A		
18	B	48	C		
19	C	49	C		
20	B	50	B		
21	C	51	D		
22	B	52	C		
23	B	53	B		
24	B	54	A		
25	D	55	A		
26	D	56	B		
27	A	57	C		
28	B	58	B		
29	B	59	B		
30	B	60	A		