

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 1

A Large Break LOCA has occurred. The following conditions exist:

- RCS Pressure = 1400 psig.
- Containment Pressure = 28 psig.
- Train "B" Safety Injection failed to actuate.
- Train "A" Safety Injection actuated and CCP/SI Pumps started.
- Containment Spray failed to actuate. ORANGE CSF for containment exists.
- All other protective functions performed as expected.

Which of the following actions should be taken FIRST according to E-0, "Reactor Trip or Safety Injection?"

- A. Trip Reactor Coolant Pumps.
- B. Enter FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE.
- C. Manually actuate Containment Spray.
- D. Manually actuate Safety Injection Train "B".

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Question 2

Given the following conditions:

- The plant is in Mode 4 conducting a heatup to Hot Standby
- All Wide Range T cold = 270° F
- Cold Overpressure Mitigation System is ARMED
- Annunciator 35B, PORV OPEN, alarms

The Annunciator Response Procedure directs the operator to “DETERMINE if the PORV should be OPEN.”

Which one of the below ANNUNCIATORS / INDICATIONS would be appropriate to use to make this determination?

- A. BB-PI-455A, “PRESSURIZER PRESSURE CHANNEL”
- B. Annunciator 56A, “RCS SATURATE”
- C. Annunciator 34D, “PRT PRESS HI”
- D. BB-PI-406, “RCS WR PRESSURE TRAIN B”

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Question 3

Given the following conditions:

- The plant is operating near End of Life (EOL) in the fuel cycle with reactor power at 100%.
- A reactor trip occurs.
- All systems respond as expected.

Which of the following is a reason for a Feedwater Isolation Signal (FWIS) on a Large Break LOCA?

The FWIS minimizes:

- A. loss of Condensate Storage Tank inventory.
- B. excessive addition of negative moderator temperature reactivity post-trip.
- C. overflow of Steam Generators.
- D. the magnitude of moderator temperature coefficient of reactivity post-trip.

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Question 4

Given the following conditions:

- The unit is at 55% power.
- The crew is performing OTO-BB-00002; RCP OFF-NORMAL, due to rising temperatures on RCP "A"
- The following conditions exist for RCP "A":
 - Thrust Bearing Upper 196 deg F
 - Motor Stator Winding 292 deg F

Which of the following limits is being exceeded, and which of the following actions should be directed in accordance with procedural requirements?

- A. Motor Stator Winding temperature is exceeding allowable limits. Trip the reactor, and then trip RCP "A".
- B. Thrust Bearing Upper temperature is exceeding allowable limits. Trip RCP "A" and then trip the reactor.
- C. Thrust Bearing Upper temperature is exceeding allowable limits. Trip the reactor and then trip RCP "A".
- D. Motor Stator Winding temperature is exceeding allowable limits. Trip RCP "A" and then trip the reactor.

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Question 5

Given the following conditions:

- The plant is shutdown for a refueling outage.
- RCS temperature is 190 degrees F.
- "A" RHR Pump has been tagged OOS for maintenance.
- Draining of the RCS has NOT been started.
- SG WR levels are 72%.

A loss of offsite power occurs. The "B" RHR pump fails to start and cannot be started.

Which of the following methods should be used to remove decay heat from the reactor as the RCS heats up?

- A. Feed and Bleed.
- B. Reflux Boiling.
- C. Natural Circulation.
- D. Fill and Spill.

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Question 6

Given the following:

- The reactor is at 100% power.
- “A” CCW train is in service and aligned to the Service Loop, with “A” CCW Pump running.
- “B”, “C”, and “D” CCW Pumps are in “AUTO”

A large break LOCA causes an automatic Safety Injection (SI).

- “B” CCW pump fails to start.

Which of the following is the reason that “D” CCW Pump automatically starts?

- A. Provides cooling flow to redundant safety-related components.
- B. Increases cooling flow to train “A” components.
- C. Increases cooling flow rate to the minimum required to accomplish safety functions.
- D. Restores flow to Service Loop.

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Question 7

Given:

- The Main Turbine tripped from 100% power on loss of condenser vacuum.
- The Reactor failed to trip automatically.

With no operator action, initially Reactor Coolant System Pressure should _____ (1) _____ and Reactor Power should _____ (2) _____ .

- | | <u>(1)</u> | <u>(2)</u> |
|-------------|------------|------------|
| A. Increase | Increase | Increase |
| B. Increase | Increase | Decrease |
| C. Decrease | Increase | Increase |
| D. Decrease | Decrease | Decrease |

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Question 8

Steam Generator "A" has sustained a Tube Rupture coincident with a Loss of Offsite Power. The crew is performing E-3, STEAM GENERATOR TUBE RUPTURE, and is ready to depressurize the RCS.

Which of the following is the preferred method for conducting the depressurization in accordance with E-3?

- A. Normal PZR Spray
- B. PZR PORV
- C. Reactor Head Vent Valves
- D. Auxiliary Spray

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Question 9

Given the following:

- The plant is operating at 100% Power near End of Life (EOL).
- A steam line break occurs upstream of S/G "A" Main Steam Isolation Valve.
- All protection systems perform as designed.

Choose the answer which correctly completes the following statement:

"The change in moderator temperature alone will insert (1) reactivity into the core. If this had occurred at Beginning of Life (BOL), the AMOUNT (absolute value) of reactivity inserted would be (2) for the same temperature change."

- | <u>(1)</u> | <u>(2)</u> |
|-------------|------------|
| A. Negative | More |
| B. Negative | Less |
| C. Positive | More |
| D. Positive | Less |

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Question 10

Given the following conditions:

- Reactor Power = 75%
- Rod control in MANUAL
- Annunciator 120A, MFP "A" Trip, illuminates
- MFP "B" is running
- All 4 steam generator levels indicate 45% NR and lowering
- All other control systems are in normal at-power alignment

Which of the following is a required immediate action in accordance with OTO-AE-00001, "FEEDWATER SYSTEM MALFUNCTION?"

- A. Trip the reactor
- B. Place Rod Control in AUTO
- C. Lower reactor power < 45%
- D. Place MFW REG Valves in MANUAL

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Question 11

Given the following:

- The reactor has tripped following a Loss of Offsite Power
- Both Emergency Diesel Generators (EDGs) failed to start automatically

Which of the below methods of manually starting an EDG would energize the Protection Bypass Circuit (ESX Relay) to bypass all BUT the Engine Vital Trips on the D/G output breaker?

- A. Emergency Start Button on the Local Generator Control Panel.
- B. Local Start pushbutton on the Local Generator Control Panel.
- C. Manual operation of the Air Start Control Valve on the EDG.
- D. Start/Reset switch from the MCB.

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Question 12

The unit is recovering from a Loss of Off-site Power. The crew is performing EOP Addendum 7, "RESTORING OFFSITE POWER." The following conditions exist:

- Vital Bus NB01 is energized by DG NE01
- Vital Bus NB02 is NOT energized
- ESF Transformer XNB01 is energized
- ESF Transformer XNB02 is energized
- DG NE02 is running but NOT paralleled to NB02

Which of the below is the appropriate method of restoring power to the ESF buses, in accordance with EOP Addendum 7?

- A. Maintain DG NE01 loaded on NB01. REENERGIZE NB02 from XNB02 using OTN-NB-0001B Addendum 005 (NB02 Loss of Power Recovery).
- B. RESTORE NB01 to XNB01 using OTN-NE-0001A Addendum 006 (Transferring Bus NB01 From NE01 to Normal or Alternate Source). REENERGIZE NB02 from XNB02 using OTN-NB-0001B Addendum 005 (NB02 Loss of Power Recovery).
- C. Maintain DG NE01 loaded on NB01. Align DG NE02 to NB02 using OTN-NE-00001B Addendum 7 (NB02 Loss of Power Recovery with NE02).
- D. RESTORE NB01 to XNB01 using OTN-NE-0001A Addendum 006 (Transferring Bus NB01 From NE01 to Normal or Alternate Source). Align DG NE02 to NB02 using OTN-NE-00001B Addendum 7 (NB02 Loss of Power Recovery with NE02).

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Question 13

Given the following:

- A reactor trip and safety injection actuation have occurred.
- Off-site power has been lost.
- Train "A" ESW Pump did not start automatically and cannot be manually started.

Which of the following actions are required by E-0, REACTOR TRIP OR SAFETY INJECTION, due to the "A" ESW Pump failure and why?

- A. Align Service Water to Train "A" ESW to provide a cooling water supply.
- B. Cross-connect ESW headers to provide cooling water supply from Train "B" ESW.
- C. Stop Train "A" Emergency Diesel Generator to prevent it from running without a cooling water supply.
- D. Stop Train "A" ECCS Pumps and place in Pull-to-Lock to prevent running without a cooling water supply.

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Question 14

Given the following conditions:

- The reactor is at 50% power.
- Restoration from a loss of Instrument Air is in progress per OTO-KA-00001, PARTIAL OR TOTAL LOSS OF INSTRUMENT AIR.
- Instrument Air pressure dropped to a low of 75 psig during the transient.

Assuming the below valves are in their FAILED positions, which of the following valves must be operated LOCALLY to restore to its normal operating position?

- A. BGLCV0459, RCS LOOP 3 LTDN TO REGEN HX DNSTRM LCV
- B. EFHV0043, ESW TO "A" AIR COMPRESSOR ISOLATION VLV
- C. EGHV0069A, CCW TO RW PROT A SPLY ISO HV
- D. KAFV0029, REACTOR BLD INST AIR SPLY FLOW CTRL VLV

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Question 15

The major actions of ECA-1.2, LOCA OUTSIDE CONTAINMENT, include verifying proper valve alignment and identifying and isolating the break.

In accordance with ECA-1.2, which of the below valves may be RE-OPENED once verified NOT to be the source of the leak?

- A. SI Pumps To Cold Leg Injection valve: EM HIS-8835
- B. RCS Letdown To Regen HX valves: BG HIS-459/460
- C. SI Pump Discharge to Hot Leg Injection valves: EM HIS-8802A/B
- D. RHR Hot Leg Recirc valve: EJ HIS-8840

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Question 16

While performing ECA-1.1, Loss of Emergency Coolant Recirculation, suction is lost to the "B" Centrifugal Charging Pump (CCP).

Which of the following actions should be taken in accordance with ECA-1.1?

- A. Transfer immediately to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.
- B. Verify proper valve alignment from RWST to "A" CCP.
- C. Secure the "B" CCP to prevent potential pump damage.
- D. Switch pump suction to the VCT and start a manual makeup to the VCT.

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Question 17

The crew has entered FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, due to a loss of all Main Feed from 100% power and subsequent failure of AFW to actuate. The following plant conditions exist:

- The reactor tripped automatically on SG Low-Low level
- SGs "A" and "B" levels = 35% WIDE RANGE and lowering slowly
- SGs "C" and "D" levels = 22% WIDE RANGE and lowering slowly
- Containment Pressure is 0 psig.

PRIOR to the initiation of Bleed and Feed, which of the following conditions ALONE would allow an exit from FR-H.1 directly to PROCEDURE AND STEP IN EFFECT at time of FR-H.1 entry?

- A. WIDE RANGE Level in all SGs restored to 50%.
- B. Condensate flow established to all SGs.
- C. NARROW RANGE Level in one SG restored to 9%.
- D. Total AFW flow to all SGs restored to 300,000 lbm/hr.

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Question 18

Given the following conditions:

- The Main Generator is paralleled to the grid.
- Reactive load is 300 MVAR(OUT)
- Voltage Regulator is in AUTOMATIC.
- Grid Voltage begins to LOWER.

Which of the following describes the generator's response?

Voltage Regulator will (1) field excitation current to (2) reactive power. The Exciter Field Breaker will trip (3) seconds after volts per hertz ratio exceeds 1.18.

- | | <u>(1)</u> | <u>(2)</u> | <u>(3)</u> |
|----|------------|------------|------------|
| A. | LOWER | DECREASE | 2 |
| B. | RAISE | INCREASE | 2 |
| C. | LOWER | DECREASE | 45 |
| D. | RAISE | INCREASE | 45 |

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Question 19

Reactor Power is 50%.

Which of the following ALARMING annunciator combinations indicates an UNCONTROLLED ROD WITHDRAWAL?

- A. 65E, T REF/T AUCTION LO; 32D, PZR HI LEV DEV HTRS ON
- B. 65D, T REF/T AUCTION HI; 82F, BANK D FULL OUT ROD STOP
- C. 65D, T REF/T AUCTION HI; 79C, ROD DEVIATION
- D. 65E, T REF/T AUCTION LO; 65C, AUCTION T AVG HI

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Question 20

Given the following:

- A reactor startup is in progress.
- The operator has just stopped moving rods.
- Power slowly increases to above the P-6 setpoint.
- One source Range (SR) channel fails Low.
- The remaining power indications stabilize at a slight constant, positive SUR.

Which of the following actions should be taken in accordance with OTO-SE-00001, NUCLEAR INSTRUMENT MALFUNCTION?

- A. Bypass the malfunctioning Source Range Channel.
- B. Trip the reactor and enter E-0, REACTOR TRIP OR SAFETY INJECTION.
- C. Hold power and do not add positive reactivity until BOTH SR channels are OPERABLE.
- D. Perform a controlled Reactor Shutdown within one hour and ensure BOTH SR channels are OPERABLE prior to the next startup.

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Question 21

Given the following:

- A reactor trip has occurred from 100% power.
- ONE Intermediate Range channel compensating voltage is set SIGNIFICANTLY too low. The other Intermediate Range channel compensating voltage is properly set.

Which of the following correctly describes the expected system response?

- A. Affected channel will drop to 10^{-11} amps too quickly. Source Range channels must be manually energized.
- B. Affected channel will drop to 10^{-11} amps too quickly. Source Range channels are automatically energized when the affected channel drops below 5×10^{-11} amps.
- C. Affected channel will stay above 10^{-10} amps. Source Range channels must be manually energized.
- D. Affected channel will stay above 10^{-10} amps. Source Range channels are automatically energized when the unaffected channel drops below 5×10^{-11} amps.

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Question 22

Given the following:

Initial Conditions:

- The plant is at 45% power
- The following alarm is received: Annunciator 116B, Cond A Vac Lo
- Condenser Backpressure indicates 7 inches HgA and stable
- The crew enters OTO-AD-00001, LOSS OF CONDENSER VACUUM, and initiates a load reduction

Current Conditions:

- Reactor Power is 27%
- Condenser Backpressure indicates 7 inches HgA and stable

Which of the following actions is REQUIRED, with Shift Manager's concurrence, in accordance with OTO-AD-00001?

- A. Continue the load reduction until the unit is off-line.
- B. Stop the load reduction and stabilize reactor power.
- C. Manually trip the main turbine and enter OTO-AC-00001, TURBINE TRIP BELOW P-9.
- D. Manually trip the reactor and main turbine and enter E-0, REACTOR TRIP OR SAFETY INJECTION.

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Question 23

A liquid radwaste release from Discharge Monitor Tank "A" is in progress.

Which of the following conditions would AUTOMATICALLY terminate the release?

- A. Radwaste Pipe Tunnel, SDRE17 Area Rad HI-HI alarm.
- B. Radwaste Bldg Discharge Line, HBRE18 Process Rad HI-HI alarm.
- C. S/G B/D DISCH PMPs DISCH, BMRE52 Process Rad HI-HI alarm.
- D. S/G B/D HXS OUT HDR, BMRE25 Process Rad HI-HI alarm.

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Question 24

Given the following conditions:

- The plant is in MODE 6.
- Annunciator 62C, AREA RAD MON FAIL, alarms.
- The affected monitor is SDRE0037, FUEL POOL BRIDGE CRANE RAD, as indicated on SD055A/B, CTRL PNL – AREA RADN MONITOR.
- All other Area Radiation Monitors indicate normal.

Which of the following is a REQUIRED action per OTA-RK-0020 ADDENDUM 62C, AREA RADIATION MONITOR FAILURE?

- A. Adjust SDRE0037 alarm setpoint.
- B. Evacuate the Fuel Building.
- C. Perform a source check of SDRE0037.
- D. Initiate a Fuel Building Isolation Signal (FBIS).

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Question 25

A reactor trip from full power has occurred due to a loss of offsite power.

The crew has entered FR-H.2, RESPONSE TO STEAM GENERATOR OVERPRESSURE, based upon a YELLOW condition on the Heat Sink CSF Status Tree.

The following conditions exist:

- Steam Generator "A" pressure indicates 1235 psig.
- Steam Generators "B", "C", and "D" pressures indicate 1125 psig.

Per FR-H.2, which of the following actions should be taken to mitigate the steam generator overpressure condition?

- A. Supply steam to a MFP turbine.
- B. Open the condenser steam dumps.
- C. Open Steam Generator "A" ASD.
- D. Supply steam to the AFP turbine.

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Question 26

Which of the below correctly lists safety features which are actuated by GT-RT-22 and GT-RT-33 (Ctmt Purge Exhaust Monitors) on a High Containment Radiation condition?

- A. Containment Isolation Signal Phase A and Containment Spray Actuation Signal
- B. Containment Isolation Signal Phase A and Control Room Ventilation Isolation Signal
- C. Containment Purge Isolation Signal and Containment Spray Actuation Signal
- D. Containment Purge Isolation Signal and Control Room Ventilation Isolation Signal

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Question 27

Given the following:

- The operating crew initiated a manual Safety Injection due to a small break LOCA.
- Equipment failures resulted in a RED condition on the Integrity CSF Status Tree.
- The crew is performing FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION. Step 15 directs operators to “ISOLATE All SI Accumulators.”

In accordance with FR-P.1, which of the following is a LOCAL operator action required to enable isolation of the SI Accumulators?

- A. Remove manual locking devices from Accumulator Isolation Valves
- B. Close power supply breakers for Accumulator Isolation Valves
- C. Open Accumulator Vent Valves
- D. Close Accumulator Isolation Valves

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Question 28

Which of the following describes the RCP no. 2 Seal during normal at-power operation?

- A. A film-riding seal with a leakoff flow rate of 3 gallons per MINUTE
- B. A film-riding seal with a leakoff flow rate of 3 gallons per HOUR
- C. A face type rubbing seal with a leakoff flow rate of 3 gallons per HOUR
- D. A face type rubbing seal with a leakoff flow rate of 3 gallons per MINUTE

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Question 29

Given the following conditions:

- The reactor is at 20% power.
- "A" RCP trips

Assuming no operator action, after reaching steady state conditions the "A" S/G pressure is driven by the operating loop (1) and the pressure is (2) it was before loss of the RCP.

- | | | |
|----|------------|-------------|
| | <u>(1)</u> | <u>(2)</u> |
| A. | Tcold; | lower than |
| B. | Tcold; | the same as |
| C. | Thot; | higher than |
| D. | Thot; | the same as |

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Question 30

Given the following conditions:

- Generator load is 578 MWe (45% turbine power) and steady.
- All Power Range channels indicate 45%.

Assuming no operator action, which of the following malfunctions would cause the boron concentrations in the PZR and RCS to differ from one another?

Loss of Reactor Coolant Pump _____.

- A. "A"
- B. "B"
- C. "C"
- D. "D"

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Question 31

Which of the following would prevent BNHV8812A, RWST TO RHR SUCTION VALVE, from OPENING?

- A. BBPV8702A, RCS TO RHR SUCTION VALVE is CLOSED
- B. EJHV8804A, RHR TO SI AND CCP VALVE is OPEN
- C. EJHV8811A, CTMT RECIRC SUMP SUCTION VALVE is OPEN
- D. BNHV8813, SI PMP MINI FLOW VALVE is CLOSED

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Question 32

Given the following:

- The plant is in Mode 4.
- RHR Train "A" is in service.
- RHR Heat Exchanger Bypass Valve EJFCV618 is set to maintain 3400 GPM.
- RHR Heat Exchanger outlet valve EJHCV606 demand position set at 30%.
- The Instrument Air supply line to RHR Heat Exchanger Bypass Valve EJFCV618 becomes severed and is completely detached.
- No other air operated valves are impacted by the failure.

Which of the following describes the RHR system parameter changes from the initial steady state conditions, as indicated in the Control Room?

	<u>RHR HX Outlet Temp.</u>	<u>Total RHR flow</u>
A.	Higher	Remains constant
B.	Higher	Lower
C.	Lower	Lower
D.	Lower	Remains constant

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Question 33

Given the following:

- A Large Break LOCA has occurred
- Safety Injection was initiated Automatically
- ECCS is in Hot Leg Recirculation lineup
- Reactor Coolant System Pressure is currently 150 psig

Which of the following correctly states the sources of ECCS flow into the Reactor Coolant System Hot Legs?

- A. SI Pumps only
- B. CCPs and SI Pumps only
- C. CCPs, SI Pumps, and RHR Pumps only
- D. SI Pumps and RHR Pumps only

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Question 34

The reactor is at 100% power.

During surveillance testing a relay fails in the actuated position resulting in an inadvertent safety injection and a reactor trip.

Reactor trip breaker 'A' DOES NOT OPEN.

What is the expected response of ECCS?

- A. Train 'A' ECCS pumps WILL NOT automatically start, but can be started by manually actuating SI on the MCB using SB HS-27 or -28.
- B. Train 'A' ECCS pumps WILL NOT automatically start, but can be manually started using associated MCB handswitches.
- C. Train 'A' ECCS pumps WILL automatically start, and can be manually stopped by placing associated MCB handswitches to STOP.
- D. Train 'A' ECCS pumps WILL automatically start, but can ONLY be stopped by placing associated MCB handswitches in PULL-TO-LOCK.

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Question 35

Given the following conditions:

- The plant was operating at 100% power.
- A LOCA has occurred.
- All safety systems performed as designed.

Which of the following components should be actively relieving to the PRT?

- A. VCT Relief
- B. RHR Suction Relief
- C. CVCS Letdown Relief
- D. RCP Seal Return Relief

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Question 36

Given the following:

- The plant is at 100% power.
- The following annunciator alarms:
 - 34E, PRT PRESS HI
- Pressurizer Relief Tank (PRT) pressure is 7 psig and RISING SLOWLY.
- PRT level is 64% and STABLE.

Complete the following statements:

If allowed to continue, the PRT rupture disc will discharge to containment when pressure rises to (1) psig.

Per OTN-BB-00004, PRESSURIZER RELIEF TANK, an available method to prevent PRT rupture disc operation and restore PRT pressure is to (2).

- | <u>(1)</u> | <u>(2)</u> |
|------------|--|
| A. 50 | Vent the PRT to a Shutdown Gas Decay Tank. |
| B. 100 | Vent the PRT to a Shutdown Gas Decay Tank. |
| C. 50 | Drain the PRT to the Reactor Coolant Drain Tank. |
| D. 100 | Drain the PRT to the Reactor Coolant Drain Tank. |

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Question 37

Given the following conditions:

- The reactor is at 100% power.
- "A" CCW train is in service and aligned to the Service Loop.
- "A" CCW Pump is operating.
- "B", "C", and "D" CCW Pumps are in AUTO.
- Surge Tank "A" level is 50% and steady.
- Surge Tank "B" level is 9% and lowering.

Assuming no operator action has been taken, which of the following correctly describes CCW flow to the RADWASTE building loads?

- A. Outermost "CCW to RW System Isolation Valves" EGHV-69A/B automatically close, and flow is secured.
- B. Innermost "CCW to RW System Isolation Valves" EGHV-70A/B automatically close, and flow is secured.
- C. Outermost AND Innermost "CCW to RW System Isolation Valves" EGHV-69A/B and EGHV-70A/B automatically close, and flow is secured.
- D. Outermost AND Innermost "CCW to RW System Isolation Valves" EGHV-69A/B and EGHV-70A/B remain open, and normal flow exists.

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Question 38

Given the following:

- The reactor is at 100% power.
- Pressurizer heaters and spray are in automatic
- The controlling Pressurizer Pressure channel fails low

Assuming NO operator action, which of the following describes system response?

- A. All heater banks energize, and the reactor trips on HI PZR PRESSURE.
- B. Both spray valves full open, and the reactor trips on LOW PZR PRESSURE.
- C. All heater banks energize, both spray valves shut, and both PORVs open.
- D. All heater banks energize, both spray valves full open, and both PORVs open.

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Question 39

Given the following conditions:

- The plant is operating at 30% steady state reactor power.
- I&C technician receives permission to perform calibration on Power Range (PR) N41.
- The I&C technician mistakenly pulls the control power fuses on Power Range (PR) N42; then, realizing his mistake, he re-inserts the fuses for N42.
- Power is subsequently lost to NN01, causing a reactor trip.

Which of the following describes the reason for the reactor trip?

- A. PR high flux, low setpoint trip.
- B. Overtemperature delta T trip.
- C. PR high flux, high setpoint trip.
- D. PR positive rate trip.

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Question 40

Given the following conditions:

- A valid Reactor Trip occurs from 100% power.
- Train "B" Reactor Trip Breaker did not open.

Which of the following would be a correct response for the above condition?

- A. Steam Dumps will control Tavg above no load value.
- B. Feedwater Isolation will only actuate on 2 of the 4 Feedwater Lines.
- C. The Main Turbine will receive a mechanical trip.
- D. Only one of the Main Feedwater Pumps will trip.

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Question 41

Given the following conditions:

- A containment pressure sensor that feeds both Safety Injection and Containment Spray failed HIGH.
- The Containment Pressure HIGH-1 and HIGH-2 Bistables for the failed sensor are in TRIP.
- The Containment Pressure HIGH-3 Bistable for the failed sensor is in BYPASS.

Which of the following identifies the correct ESF actuation logic for the remaining Containment Pressure channels?

- A. Main Steam Line Isolation – 1/2; Containment Spray – 1/3
- B. Main Steam Line Isolation – 1/2; Containment Spray – 2/3
- C. Main Steam Line Isolation – 1/3; Containment Spray – 1/3
- D. Main Steam Line Isolation – 1/3; Containment Spray – 2/3

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 42

Given the following conditions:

- The plant tripped due to SG high level.
- Safety Injection did not occur.
- The Reactor Trip Breakers are open.
- Steam Generator levels have been restored with Auxiliary Feedwater in service.
- Steam Dumps are controlling TAVG at the no load value.
- NO manual resets of plant systems have been performed.

Which of the following conditions would prevent the Feedwater Isolation Signal from being reset?

- A. TAVG is below the LO TAVG setpoint.
- B. The Reactor Trip Breakers are OPEN.
- C. The Auxiliary Feedwater Pumps are running.
- D. The SG LO LO level has NOT been manually reset.

NRC Site-Specific Written Examination
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Question 43

Operators are completing actions for a Main Steamline Break in Containment in accordance with E- 0, Reactor Trip or Safety Injection, following a Main Steam Line Break in Containment. What is the required status of the Containment Cooler Fans?

- A. The Containment Cooler Fans AUTOMATICALLY stop to prevent an electrical short circuit.
- B. The Containment Cooler Fans MUST be manually stopped to prevent an electrical short circuit.
- C. The Containment Cooler Fans AUTOMATICALLY shift to slow speed to prevent an overload condition.
- D. The Containment Cooler Fans MUST be manually shifted to slow speed to prevent an overload condition.

NRC Site-Specific Written Examination
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Question 44

What is the power supply to Containment Spray Pump A?

- A. NB01
- B. NB02
- C. PB03
- D. PB04

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 45

Given the following conditions:

- The Plant is at 100% power.
- ABPV0001, SG "A" Atmospheric Steam Dump Valve, is in LOCAL and CLOSED.
- All 4 Main Steam Isolation Valves inadvertently CLOSE.

Steam Generator "A" MAXIMUM pressure is limited by _____ (1) _____ due to
_____ (2) _____.

- | (1) | (2) |
|------------------------------------|---|
| A. ABPV0001 ASD | pressure reaching ASD setpoint |
| B. SG "B", "C", and "D" ASD valves | pressure reaching their pressure setpoint |
| C. SG "A" Safety Valves | ABPV0001 unavailability |
| D. Reactor Trip | minimal heat input to the SGs |

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 46

Which of the following signals will cause a Feedwater Isolation?

- A. An uncomplicated Reactor Trip from power.
- B. A manual Phase A (CISA) actuation.
- C. An automatic start of the Turbine Driven Auxiliary Feedwater Pump.
- D. An automatic start of the Motor Driver Auxiliary Feedwater Pumps.

NRC Site-Specific Written Examination
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Question 47

Given the following conditions:

- A plant trip occurs from 100% power due to a TRIP of both Main Feedwater Pumps.
- The Turbine Driven Auxiliary Feedwater Pump is unavailable.

Which of the following correctly describes the Auxiliary Feedwater (AFW) Pump Motor Operated AFW Flow Control Valves AUTOMATIC response?

- A. The valves throttle to control total flow at approximately 355,000 LBM/HR to limit cooldown rate.
- B. The valves throttle to control individual Steam Generator flows to <300 GPM to prevent pump cavitation.
- C. The valves remain full open to ensure maximum flow until SG levels return to the normal band.
- D. The valves throttle to control SG levels at the normal operating level.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 48

The normal flowpath of power to Safeguards Bus NB02 is: Switchyard, _____, _____, and NB02.

- A. ESF LTC XMFR, SAFEGUARDS XMFR
- B. SAFEGUARDS XMFR, ESF LTC XMFR
- C. ESF LTC XMFR, STARTUP XMFR
- D. STARTUP XMFR, ESF LTC XMFR

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 49

The control room switches for the 345 KV Switchyard Breakers have a green light and DUAL RED LIGHT indications on Main Control Room Panel RL014.

When the dual red lights are BOTH LIT what does this indicate?

- A. BOTH the Breaker at Callaway and the Breaker at the other end of the line are CLOSED.
- B. Two separate Trip Coils are available to trip the Callaway Breaker.
- C. The Callaway Breaker is Closed and Automatic Reclosure is Available.
- D. The Callaway Breaker is Closed and H.P. Gas Pressure is Normal.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 50

A fire is detected and verified in the "A" D/G room.

Which of the following describes the automatic response of the "A" D/G and the "A" Fuel Oil Transfer Pump?

- A. If the D/G is running, the D/G and the Fuel Oil Transfer Pump both stop.
- B. If the D/G is running, the D/G remains running and the Fuel Oil Transfer Pump stops.
- C. If the D/G is NOT running, neither it, nor the Fuel Oil Transfer Pump will start on a D/G start signal.
- D. If the D/G is NOT running, both the D/G and the Fuel Oil Transfer Pump will start as they normally would on a D/G start signal.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 51

Given the following conditions:

- Discharge Monitor Tank "A" is being released to the environment
- Power is lost to HBRE0018, RW BLD DISCH LINE HB-RE-0018 GAMMA DET

What actions are taken as a result of this power loss?

- A. Notify Radwaste to verify HBFV0866, LRW DISCH FCV, automatically CLOSED to the Cooling Tower Blowdown Line.
- B. Notify Radwaste to verify HBFV0866, LRW DISCH FCV, automatically CLOSED to Circulating Water Return Line.
- C. Notify Radwaste to manually isolate HBFV0866, LRW DISCH FCV, to the Cooling Tower Blowdown Line.
- D. Notify Radwaste to manually isolate HBFV0866, LRW DISCH FCV, to Circulating Water Return Line.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 52

Which of the following would cause Train "A" Essential Service Water (ESW) to PARTIALLY ISOLATE from the Service Water (SW) System by leaving the return valves from ESW to SW open?

- A. Shutdown Sequencer Actuation.
- B. An inadvertent Containment Spray Signal Actuation.
- C. Low Suction Pressure to the Auxiliary Feedwater Pumps with AFAS.
- D. Low ESW flow to the Train "A" Containment Coolers with an Undervoltage on NB02.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 53

KAFV0029, Reactor Bld Inst Air Sply Flow Ctrl Vlv, is a/an _____ valve and closes on _____.

- A. Air Operated Valve, Pressure downstream lowering to 110 psi
- B. Air Operated Valve, Containment Isolation Signal Phase A
- C. Motor Operated Valve, Pressure downstream lowering to 110 psi
- D. Motor Operated Valve, Containment Isolation Signal Phase A

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 54

Given the following conditions:

- The Unit is at 100% power.
- There is a Secondary STEAM LEAK inside containment.
- Containment Pressure has increased from 0.2 psig to 3.0 psig in the past 15 minutes.
- Containment Temperature and Humidity are increasing.

What automatic actions will occur to stop the containment pressure and temperature increase?
Assume no operator actions.

- A. Reactor Trip
- B. Safety Injection Signal
- C. Steam Line Isolation Signal
- D. Containment Spray Actuation Signal

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 55

A large steam break has occurred downstream of the Main Steam Isolation Valves in Mode 1.

What are the required operator actions in respect to Containment Isolation Valves?

- A. Automatic Containment Isolation Phase A has occurred. Verify all Phase A valves closed on ESFAS Status Panels.
- B. Manually Initiate Phase A Isolation due to no Automatic Signal generated. Verify all Phase A valves closed on ESFAS Status Panels.
- C. Automatic Containment Isolation Phase A & Phase B has occurred. Verify all Phase A & Phase B valves closed on ESFAS Status Panels.
- D. Manually Initiate Phase A & Phase B Isolation due to no Automatic Signal. Verify all Phase A & Phase B valves closed on ESFAS Status Panels.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 56

Given the following conditions:

- The Plant was initially at full power with Automatic Rod Control UNAVAILABLE.
- A Feedwater Heater Malfunction caused Reactor Power to exceed 100%.
- The Control Room Operator started a SLOW turbine load reduction.
- RCS Tav_g is now >5 degrees F above Tref and Reactor Power is approximately 95%.

Which of the following actions would now be taken by the control room operator?

- A. Manually insert Control Rods until RCS Tav_g is within 1.5 degrees F of Tref, THEN stop turbine load change.
- B. Raise Turbine Load while manually inserting Control Rods until RCS Tav_g matches Tref, THEN stop Control Rod movement and Turbine Load Change.
- C. Stop Turbine Load reduction, THEN insert Control Rods until RCS Tav_g is within 1.5 degrees F of Tref.
- D. Stop Turbine Load reduction, THEN slowly raise Turbine Load until RCS Tav_g matches Tref.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 57

Certain instrumentation is installed in the plant for early indication/warning of Reactor Coolant System Leakage per Technical Specifications.

Which of the following satisfies this requirement?

- A. Containment NORMAL sump level and flow monitoring
- B. Containment ECCS sump level and flow monitoring
- C. Containment High-1 Pressure Alarm.
- D. Pressurizer Low Pressure Alarm.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 58

Bank D Control Rod Step Counters indicate the control rods to be at 216 steps. DRPI light indication is that the rods are at 210 steps.

What is the actual rod position?

- A. Indeterminate, because the step counters don't agree with the DRPI indication.
- B. At 216 steps, because the step counters are more accurate.
- C. At 210 steps, because the DRPI indication is from mechanical reed switches.
- D. Between 206 and 214 steps because of DRPI accuracy.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 59

Given the following conditions:

- The Containment Mini-Purge System is in operation to reduce the concentrations of noble gasses in containment.
- The control room receives “Charcoal High Temperature Alarm 200 Degrees” alarm.

What actions automatically occur as a result of this alarm?

- A. The operating CTMT MINI PURGE EXH FAN stops and the alternate fan automatically starts.
- B. The operating CTMT MINI PURGE EXH FAN stops and the alternate fan must be manually started.
- C. The operating CTMT MINI PURGE EXH FAN & DAMPER, fan stops and damper closes.
- D. Fire protection is initiated (begins spraying) to the affected charcoal bed.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 60

Given the following conditions:

- The Unit is in Mode 5.
- You are preparing to place the Shutdown Purge System in service to Containment.
- The Equipment Hatch is closed.
- SGT01, CTMT S/D PURGE AIR SUPPLY UNIT, is unavailable.

Which of the following correctly describes the actions that CAN or CANNOT be taken due to the unavailability of SGT01, CTMT S/D PURGE AIR SUPPLY UNIT?

- A. You cannot place the Shutdown Purge System in service without SGT01. Containment pressure would become excessively negative.
- B. You can place the Shutdown Purge System in service. SGT01 only affects the ability to control containment temperature.
- C. You can place the Shutdown Purge System in service. SGT01 is only needed when the Equipment Hatch is open.
- D. You cannot place the Shutdown Purge System in service without SGT01. Containment pressure would become positive.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 61

The Main Generator is about to be synchronized to the Grid with the following conditions:

- The SYNC-SCOPE is rotating 1 RPM in the FAST direction.
- Switchyard Voltage is slightly lower than Main Generator Voltage.

Which of the following responses is correct for synchronization?

- A. The Generator speed and voltage are correct for synchronization.
- B. The Main Generator Speed is correct. Decrease Main Generator Voltage slightly below Switchyard Voltage using MB HS-6, VOLT REG LOWER/RAISE.
- C. The Main Generator Voltage is correct. Decrease Main Generator Speed using LOAD SELECTOR pushbutton, INCREASE LOAD until SYNC-SCOPE is rotating 1 RPM in the SLOW direction.
- D. Decrease Main Generator Voltage slightly below Switchyard Voltage using MB HS-6, VOLT REG LOWER/RAISE and decrease Main Generator Speed using LOAD SELECTOR pushbutton, DECREASE LOAD, until SYNC-SCOPE is rotating 1 RPM in the SLOW direction.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 62

Given the following conditions:

- The Unit is at 100% Power
- GERE0092, Condenser Air Removal Radiation Monitor, alarmed 1 hour ago.
- Chemistry Department confirms a leakrate of 0.2 GPM into Steam Generator "D".

What is the correct response for this leakage?

- A. This leak is now IDENTIFIED LEAKAGE and below the Technical Specification allowed limit.
- B. This is PRESSURE BOUNDARY LEAKAGE and below the Technical Specification allowed limit.
- C. This leakrate requires a controlled plant shutdown.
- D. This leakrate requires an immediate Reactor Trip.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 63

Given the following conditions:

- The plant is currently at 50% power and raising toward 100% power
- Two (2) Condensate Pumps are in service
- One (1) Main Feedwater Pump is in service

One of the running Condensate Pumps trips unexpectedly. What is the required operator action per OTO-AE-00001, FEEDWATER SYSTEM MALFUNCTION?

- A. Manually TRIP the Reactor due to imminent loss of heat sink.
- B. Manually START the alternate Condensate Pump.
- C. Verify the alternate Condensate Pump AUTOMATICALLY starts.
- D. Quickly REDUCE Reactor Power to raise Main Feedwater Pump suction pressure.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 64

Given the following conditions:

- NB01 is on its alternate power source.
- Train A Essential Service Water Pump is running.
- Diesel Generator NE01 is unavailable
- NB01 is to be FAST TRANSFERRED back to its normal power source.

Which of the following would be an effect of this transfer?

- A. Train A ESW Pump will continue to run.
- B. Train A ESW Pump loses power during the transfer.
- C. Train B ESW Pump will auto start.
- D. Train B ESW Pump will align to the Containment Coolers.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 65

Given the following conditions:

- The plant is experiencing a problem with lowering Instrument Air Pressure.
- "Inst Air Dryer Press Low" ALARM has been received.
- The Plant Equipment Operators have been dispatched to investigate the cause.
- The Instrument Air Pressure at the air compressors discharge indicates 95 psig and slowly decreasing.

Which of the following conditions reported from the field is NOT CONSISTENT with the present air pressure per the SYMPTOMS of OTO-KA-00001, Partial or Total Loss of Instrument Air.

- A. KAPV0011, Compress Air Sys Serv Air Sply Press Ctrl Vlv is OPEN.
- B. All three Air Compressors are running LOADED.
- C. The Standby Dryer Inlet/Outlet Valves are OPEN.
- D. KAFV0029, Rx Bld Inst Air Sply Flow Ctro Vlv is OPEN.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 66

Given the following conditions:

- The plant is in Mode 1.
- The present shift consists of the minimum shift licensed staff.
- 1 hour before shift change one RO gets sick and leaves the site.
- The oncoming shift consists of minimum shift licensed staff.
- One of the oncoming RO's has car problems and will be 2 hours late.

Which of the below conditions is acceptable for Shift Manning per ODP-ZZ-00001, OPERATIONS DEPARTMENT – CODE OF CONDUCT?

- A. The off going RO must stay until 2 RO's are on shift.
- B. The off going RO may leave if another RO will be available within 1 hour of shift change.
- C. The off going RO may leave because 2 RO's will be available within 2 hours of shift change.
- D. The off going RO may leave because one of the oncoming SRO's can also fill an RO position for 2 hours.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 67

Given the following conditions:

- The Plant is stable at 28% Power, returning to 100% Power from a refuel outage.
- The first Heater Drain Pump was just started.
- The Chemistry Technician calls the Control Room and reports several chemistry parameters are above Action Level 1 limits.

What are your required actions?

- A. Action Levels are not applicable at this Power Level.
- B. Restore to within limits in 24 Hours.
- C. Immediately commence a controlled plant shutdown to Mode 3.
- D. Immediately Trip the Reactor and enter E-0, REACTOR TRIP OR SAFETY INJECTION.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 68

The plant is at 100% power and the WCC, Work Control Center, is not activated.

Who, by title, is authorized to approve access to the Switchyard, per APA-ZZ-00322, Work Control Center Organization and Operation?

- A. Control Room Supervisor
- B. Security Shift Supervisor
- C. Work Week Manager
- D. Power Supply Supervisor

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 69

An approved procedure is being used in the field to run plant equipment. The performer determines the procedure cannot be performed as written. The performer stops the evolution but believes that an In-Field Correction is appropriate.

Which of the following criteria WOULD NOT ALLOW an In-Field Correction and completion of procedure?

- A. The procedure references are incorrect.
- B. Incorrect database name due to recent update.
- C. The supervisor verbally approves the procedure to be continued.
- D. Obvious incorrect position and correct position is verified.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 70

The plant is at 50% power. You are walking down the control boards prior to assuming the shift when you notice AL HK-7A, SG A MD AFP AFW REG VLV CTRL is in mid position. Based on this observation, which of the following statements is correct.

- A. Motor Driven Auxiliary Feedwater Pump "A" is unable to perform its design function.
- B. Motor Driven Auxiliary Feedwater Pump "B" is unable to perform its design function.
- C. Steam Generator "A" is unable to perform its design function.
- D. All components can still perform their design functions. Restore AL HK-7A to its required position.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 71

You are required to enter an area with a radiation level of 1200 mrem/hour at 30 centimeters.

What are your requirements to enter this area?

- A. A Specific Radiation Work permit due to being a Locked High Radiation Area.
- B. A Specific Radiation Work permit due to being a High Radiation Area.
- C. A General Radiation Work Permit due to being a Locked High Radiation Area.
- D. A General Radiation Work Permit due to being a High Radiation Area.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 72

EG-RE-10, Component Cooling Water Radiation Monitor has just turned RED.

What automatic actions occur as a result of this increase in radiation?

- A. Both EGRV0010, CCW SRG TK B VENT CTRL VLV, and EGLV0002, DI WTR TO CCW STG TK B LV, will get a CLOSE signal.
- B. Only EGRV0010, CCW SRG TK B VENT CTRL VLV, will get a CLOSE signal.
- C. Only EGLV0002, DI WTR TO CCW STG TK B LV, will get a CLOSE signal.
- D. No automatic actions will occur. Sample the CCW Surge Tank B for confirmation.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 73

Given the following conditions:

- The generator load is 120 MWe (9.4% turbine power) during a power increase.
- ABUV34, Steam Dump Valve, Indicates Group 1 Steam Dumps 10% open.

Which of the following conditions will require entry into E-0, REACTOR TRIP OR SAFETY INJECTION?

- A. Pressurizer Level increases to 93%
- B. Pressurizer Pressure lowers to 1970 psig.
- C. One Reactor Coolant Pump trips.
- D. All turbine governor and stop valves close.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 74

Given the following conditions:

- The Electric Fire Pump has been placed in Recirculation per OTN-KC-00001 Addendum 13.
- The Fire Water Storage Tank LEVELS are about to drop below their 31 feet minimum.

Which of the following options are available to fill the Fire Water Storage Tanks?

- A. Ensure the automatic fill of the Fire Water Storage Tanks starts at 31 feet setpoint.
- B. The Electric Fire Pump must be taken out of Recirculation before the Fire Water Storage Tanks can be filled.
- C. The Electric Fire Pump can be left in Recirculation for a maximum of 4 HOURS during the fill of the Fire Water Storage Tanks.
- D. The Electric Fire Pump can be left in Recirculation for an unlimited amount of time during the fill of the Fire Water Storage Tanks.

NRC Site-Specific Written Examination
Callaway Plant
Reactor Operator

Question 75

The Plant is at 180 degrees F and 325 psig with both RHR Trains in service in the cooldown mode. The Pressurizer PORV's are lined up for COMS.

What is the sequence of overpressure protection with a rising RCS Pressure?

(REFERENCE PROVIDED)

- A. Pressurizer PORV PCV-456A, RHR Suction Relief Valves, and then Pressurizer PORV PCV-455A.
- B. Pressurizer PORV PCV-455A, RHR Suction Relief Valves, and then Pressurizer PORV PCV-456A.
- C. RHR Suction Relief Valves, Pressurizer PORV PCV-456A, and then Pressurizer PORV PCV-455A.
- D. RHR Suction Relief Valves, Pressurizer PORV PCV-455A, and then Pressurizer PORV PCV-456A.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 76

Given the following conditions:

- The plant is in Mode 4.
- All RCS cold leg temperatures < 275F.
- Cold Overpressure Mitigation System (COMS) is armed.
- Both RHR Suction Relief Valves are INOPERABLE due to improper setpoints.
- At 0800 on Jan 1, PORV PCV-455A fails a Channel Operational Test required by SR 3.4.12.8.
- At 0900 on Jan 3, PORV PCV-456A begins leaking by its seat and is declared INOPERABLE.
- At 1200 on Jan 3, PORV PCV-455A repairs are complete and the Channel Operational Test is satisfactory.

(1) What MINIMUM action(s) would result in the PORV Block Valve closing?

(2) Based on the above conditions, per the Technical Specifications the RCS is required to be depressurized and vented no later than _____.

(REFERENCE PROVIDED)

- A. (1) Depress "BLOCK" pushbutton on COMS Train B, and place Block Valve Control Switch to "CLOSE".
(2) 2100 on Jan 10.
- B. (1) Place Block Valve Control Switch to "CLOSE".
(2) 2100 on Jan 10.
- C. (1) Depress "BLOCK" pushbutton on COMS Train B, and place Block Valve Control Switch to "CLOSE".
(2) 2000 on Jan 9.
- D. (1) Place Block Valve Control Switch to "CLOSE".
(2) 2000 on Jan 9.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 77

Given:

- A Small Break LOCA has occurred in the Aux Building.
- The reactor tripped and SI initiated.
- The crew is performing ECA-1.2, LOCA Outside Containment.
- Several paths to outside containment contain misaligned valves.

Which of the following correctly states:

(1) A valve that ECA-1.2 allows to be closed LOCALLY if manual action is unsuccessful; and

(2) The procedure that should be transitioned to if the break is NOT isolated at conclusion of ECA-1.2?

- A. (1) EMHV8803A, Boron Injection Header Inlet
(2) ECA-1.1, Loss of Emergency Coolant Recirculation
- B. (1) EMHV8964, SI System Test Line Containment Isolation Valve
(2) ECA-1.1, Loss of Emergency Coolant Recirculation
- C. (1) EMHV8964, SI System Test Line Containment Isolation Valve
(2) E-1, Loss of Reactor or Secondary Coolant
- D. (1) EMHV8803A, Boron Injection Header Inlet
(2) E-1, Loss of Reactor or Secondary Coolant

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 78

Given the following conditions:

- The plant has been operating at 100% power for several weeks.
- The reactor tripped on Low Pressurizer Pressure
- SI has initiated
- At the time of trip, the following parameters were observed:
 - Pressurizer Level LOWERING
 - Containment Humidity, Pressure, and Temperature RISING
 - Pressurizer Pressure LOWERING
 - Reactor Power indications:
 - N41 = 102.0% and rising
 - N42 = 101.8% and rising
 - N43 = 101.4% and rising
 - N44 = 102.8% and rising
 - S/G "A" Level = 62%; SGs "B" / "C" / "D" Levels = 55%
- The crew is performing E-0, REACTOR TRIP OR SAFETY INJECTION.

What casualty has occurred, and what procedure should be transitioned to?

- A. LOCA; Transition to E-1, LOSS OF REACTOR OR SECONDARY COOLANT
- B. Steam Line Break; Transition to E-2, FAULTED STEAM GENERATOR ISOLATION
- C. LOCA; Transition to ES-1.2, POST-LOCA COOLDOWN AND DEPRESSURIZATION
- D. Steam Line Break; Transition to E-1, LOSS OF REACTOR OR SECONDARY COOLANT

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 79

Given:

- The reactor is operating at 75% power
- The following alarms are received:
 - Annunciator 120A, MFP A Trip
 - Annunciators 108/109/110/111D, SGs A/B/C/D Flow Mismatch
- All SG levels are 47% and lowering

Which of the following Operator Actions should the CRS direct the crew to take?

- A. Manually trip the Reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION, in accordance with OTO-AE-00001, FEEDWATER SYSTEM MALFUNCTION.
- B. Reduce reactor power to less than 65% while maintaining MFP suction pressure > 300 psig using OTO-AE-00001, FEEDWATER SYSTEM MALFUNCTION Attachment A: LOAD REDUCTION.
- C. Ensure Main Feed pump Turbine control is in AUTO and maintaining SG levels at program in accordance with OTO-AE-00001, FEEDWATER SYSTEM MALFUNCTION.
- D. Reduce Turbine Load to less than 50% using OTO-MA-00008, RAPID LOAD REDUCTION and manually trip the Main Turbine.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 80

Given the following conditions:

- The plant is in Mode 3
- The following alarm is received in the control room:
 - 25C, NK01 TROUBLE
- NK01 Voltage indicates 120 VDC and lowering slowly.
- Battery NK11 indicates 220 amps Discharge
- The following alarms are displayed on NK01:
 - 2B, CHARGER FAILURE
 - 4B, CHARGER DC BREAKER OPEN
 - 6A, CHARGER DC UNDERVOLTAGE

Which of the following describes the operability of the DC Distribution System, and the action required?

- A. Declare Bus NK01 INOPERABLE because there is NO Battery Charger connected. Enter OTO-NK-00002, LOSS OF VITAL 125 VDC BUS, to align an operable battery charger to Bus NK01.
- B. Bus NK01 remains OPERABLE because bus remains energized. Enter OTO-NK-00002, LOSS OF VITAL 125 VDC BUS, to align an operable battery charger to Bus NK01.
- C. Declare Bus NK01 INOPERABLE because there is NO Battery Charger connected. Align an operable Battery Charger to Bus NK01 in accordance with alarm response procedures and OTN-NK-00001, CLASS 1E 125VDC ELECTRICAL SYSTEM.
- D. Bus NK01 remains OPERABLE because bus remains energized. Align an operable Battery Charger to Bus NK01 in accordance with alarm response procedures and OTN-NK-00001, CLASS 1E 125VDC ELECTRICAL SYSTEM.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 81

According to the Technical Specification Bases, the Essential Service Water (ESW) system design basis is met with a MINIMUM of (1) train(s) of ESW in conjunction with (2) .

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|---|
| A. | ONE | The CCW System and ONE Steam Generator |
| B. | ONE | The CCW System and a 100% capacity containment cooling system |
| C. | TWO | The CCW System and ONE Steam Generator |
| D. | TWO | The CCW System and a 100% capacity containment cooling system |

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 82

Given the following conditions:

- Reactor power is 100%.
- RCS leak rate data is as follows:

	<u>0700</u>	<u>0730</u>	<u>0800</u>
○ Total RCS leakage rate:	10.1 gpm	10.2 gpm	10.3 gpm
○ Leakage to PRT:	8.0 gpm	8.0 gpm	8.1 gpm
○ Leakage to RCDT:	1.3 gpm	1.4 gpm	1.4 gpm
○ "A" S/G primary to secondary:	0.050 gpm	0.065 gpm	0.080 gpm

What action, if any, is required to be taken at 0800?

- A. Rapidly reduce load to 50% in 1 hour followed by a shutdown to Mode 3 within the next 2 hours.
- B. Commence a controlled shutdown to be in Mode 3 within 6 hours, maximum.
- C. Commence a controlled shutdown to be in Mode 3 within 24 hours, maximum.
- D. No additional action is required to be taken at this point.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 83

A fire has broken out in the Control Room. The crew is performing OTO-ZZ-00001, CONTROL ROOM INACCESSIBILITY.

- 1) Which situation would require an RCS cooldown, per OTO-ZZ-00001?
- 2) Who may direct an RCS cooldown, per OTO-ZZ-00001?
 - A. 1) Plant control cannot be established in the Control Room within 2 hours of evacuation.
2) Shift Manager or TSC.
 - B. 1) RCP Seal Injection was isolated during Control Room evacuation.
2) TSC only.
 - C. 1) Plant control cannot be established in the Control Room within 2 hours of evacuation.
2) TSC only.
 - D. 1) RCP Seal Injection was isolated during Control Room evacuation.
2) Shift Manager or TSC.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 84

Given the following conditions:

- A LOCA has occurred and the crew is performing E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
- All RCPs are secured.
- Core Exit Thermocouples indicate 800 degrees F and slowly rising.
- RVLIS Pumps Off indicates 40% and slowly lowering.
- All Steam Generator levels indicate 15% Narrow Range

(1) Which procedure should the Control Room Supervisor direct the crew to transition to; and

(2) Which method for reducing RCS temperature should be directed?

	<u>(1)</u>	<u>(2)</u>
A.	FR-C.1, RESPONSE TO INADEQUATE CORE COOLING	Depressurize intact Steam Generators
B.	FR-C.2, RESPONSE TO DEGRADED CORE COOLING	Depressurize intact Steam Generators
C.	FR-C.1, RESPONSE TO INADEQUATE CORE COOLING	Start an available RCP
D.	FR-C.2, RESPONSE TO DEGRADED CORE COOLING	Start an available RCP

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 85

The following plant conditions exist:

- A large break LOCA has occurred
- Containment pressure is 11 psig
- Containment normal sump level is 86 inches
- Containment radiation level is 150 R/hr
- RWST level is 46%
- Critical Safety Functions are being monitored.

Which of the following procedures should be utilized for the above conditions?

- A. FR-Z.3, RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL
- B. FR-Z.2, RESPONSE TO CONTAINMENT FLOODING
- C. FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE
- D. ES-1.3, TRANSFER TO COLD LEG RECIRCULATION

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 86

Given the following conditions:

- The reactor is at 100% power.
- A loss of Aux Steam to the RWST has occurred.
- MCB Annunciator 47E, RWST TEMP LO-LO, is alarming.
- RWST temperature is 47 degrees F and lowering slowly.

What is the status of the RWST, and how should heat be restored?

- A. The RWST is INOPERABLE; Restore heat to RWST using OTN-BN-00001, BORATED REFUELING WATER STORAGE SYSTEM.
- B. The RWST is INOPERABLE; Restore heat to RWST using OTN-QJ-00003, PLANT FREEZE PROTECTION HEAT TRACING PROCEDURE.
- C. The RWST is OPERABLE; Restore heat to RWST using OTN-QJ-00003, PLANT FREEZE PROTECTION HEAT TRACING PROCEDURE.
- D. The RWST is OPERABLE; Restore heat to RWST using OTN-BN-00001, BORATED REFUELING WATER STORAGE SYSTEM.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 87

In accordance with Technical Specification Basis 3.7.7 and the FSAR, which of the following is a safety design basis function of the Component Cooling Water System (CCWS)?

- A. Remove decay heat from the reactor via the RHR system during a normal or post accident cooldown and shutdown.
- B. Remove heat from components important to mitigating the consequences of a LOCA or MSLB and transfer the heat to the Service Water System.
- C. Provide cooling flow to RCP components to prevent pump damage.
- D. Prevent Demineralizer resin damage by providing non-regenerative heat removal to the letdown heat exchanger.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 88

Given the following conditions:

- A rapid turbine load reduction of 300 MW from rated thermal power just occurred.
- Both PZR PORV's opened due to high PZR pressure.
- PZR pressure is now 2200 psig and slowly lowering.
- Automatic PZR PRESSURE CONTROL is responding correctly.
- PCV 0455A, PZR PORV indicates mid position.

What is the required operator response?

- A. Depress BLOC on the COMS BLOC Switch per OTA-RK-00020, Annunciator Response Procedure.
- B. Close HV8000A, PORV BLOCK VALVE to restore PZR pressure per OTA-RK-00018, Annunciator Response Procedure.
- C. Place all PRZ Heaters to ON to restore PZR pressure per OTA-RK-00020, Annunciator Response Procedure.
- D. Close HV8000B, PORV BLOCK VALVE to restore PZR pressure per OTA-RK-00018, Annunciator Response Procedure.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 89

Given the following conditions:

- RCS average temperature is 295 degrees F.
- Maintenance is being conducted in the switchyard.
- At 0900 the crane operator loses control of the crane, causing it to strike the line between MDV41 and MDV43, opening both breakers.
- Electricians inspect the line and inform you there is no damage and the line can be energized by 1100.

Which of the following actions is required by OSP-NE-00003, Technical Specifications – A.C. Sources?

- A. Within 1 hour verify correct breaker alignment and power availability for the operable off-site circuit.
- B. No actions are required since the LCO is still met.
- C. Within 1 hour perform monthly surveillance tests on both D/Gs.
- D. Suspend any positive reactivity additions until the Startup Transformer is reenergized.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 90

Given the following conditions:

- The plant is shutdown with the core offloaded
- OSP-NE-0001B, Standby Diesel Generator Periodic Tests, is in progress
- Diesel Generator B 24 hr full load test is in progress

A subsequent Loss of Offsite Power occurs

Which of the following procedures applies for this situation?

- A. E-0, Reactor Trip or Safety Injection
- B. ECA-0.0, Loss of All AC Power
- C. OTO-NB-00002, Loss of Power to NB02
- D. OTO-NB-00004, LOOP To NB01/NB02 With EDG Paralleled

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 91

Given the following conditions:

- The Plant has just returned to 100% Power following an outage
- Alarm window 58D, RV Flange Leakoff Temperature High, is lit
- Containment Pressure and Temperature are steady
- BB TI-401, Reactor Vessel Flange Leakoff Temp indicates 170 degrees F and steady.

What are the alarm implications based on these indications?

- A. Alarm 58D is valid. Check Reactor Coolant Drain Tank for level change.
- B. Alarm 58D is valid. Shutdown immediately due to Pressure Boundary Leakage.
- C. Alarm 58D is invalid, based on current leakoff temperature.
- D. Alarm 58D is invalid, based on containment pressure and temperature.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 92

Given the following conditions:

- Core offload is in progress.
- A fuel assembly is about to be placed in the Upender Basket in Containment
- A fuel assembly is dropped in the Fuel Pool

Fuel Handling is ordered to be secured per OTO-KE-00001, FUEL HANDLING ACCIDENT.

What is the acceptable storage location for the fuel bundle in transit in Containment?

- A. Leave it in the Refuel Machine.
- B. Lower it into the Upender Basket and Frame Down to the Horizontal position.
- C. Lower it into the RCCA change fixture.
- D. Place it back in the Reactor Vessel.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 93

Given the following conditions:

- The plant is at 100% power
- AB PIC-1A, SG "A" Atmospheric Steam Dump (ASD) fails open and cannot be closed by the Reactor Operator

What are the required directions per OTO-AB-00001, STEAM DUMP MALFUNCTION, to address the failed ASD, and can the plant continue to operate?

- A. Direct the Plant Operator to close the Air/N₂ Isolation Valve for the affected ASD and then open the Air/N₂ drain valve. The plant can continue to operate indefinitely at a reduced power of 85%.
- B. Direct the Plant Operator to unlock and close the Manual Isolation Valve for the affected ASD. The plant must be shutdown per Technical Specifications if the ASD is not repaired in 7 days.
- C. Direct the Plant Operator to close the Air/N₂ Isolation Valve for the affected ASD and then open the Air/N₂ drain valve. The plant must be shutdown per Technical Specifications if the ASD is not repaired in 7 days.
- D. Direct the Plant Operator to unlock and close the Manual Isolation Valve for the affected ASD. The plant can continue to operate indefinitely at a reduced power of 85%.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 94

Given the following conditions:

- The plant is at 100% Power
- A Heater Drain Pump TRIPS
- All Steam Generator NR Levels are approximately 25% and lowering

What is the best course of action for this event per OTO-AE-00001, FEEDWATER SYSTEM MALFUNCTION?

- A. Manually TRIP the Reactor
- B. Reduce Turbine Load > 5% per minute using the Load Limit Potentiometer
- C. Place the Start-Up Main Feedwater Pump in Service
- D. Manually START the Turbine Driven Auxiliary Feedwater Pump

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 95

Which of the below statements are correct in accordance with APA-ZZ-00100, WRITTEN INSTRUCTION USE AND ADHERENCE?

- A. Independent Verification (IV) involving plant status control may be waived for ALARA or personnel safety hazard by the SM/CRS.
- B. A 10CFR50.54x/y exception that departs from a License Condition must be approved by the Plant Director.
- C. An SRO must authorize a continuous use procedure to be continued from one shift to the next.
- D. A verbal or written plan must be approved by the SM/CRS prior to proceeding with backing out of a procedure that cannot be completed as written.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 96

Given the following conditions:

- Train A Control Room Emergency Ventilation System Pressurization Filter Unit monthly surveillance was scheduled on November 30, 2010.
- At 8:00 AM on December 15, 2010, it was discovered that the surveillance was never performed.
- A risk evaluation is completed at 9:15 AM on December 15, 2010.

What is the LATEST TIME that the surveillance can be completed without declaring Train A Control Room Emergency Ventilation System inoperable?

- A. Complete the surveillance no later than midnight December 15, 2010.
- B. Complete the surveillance no later than 8:00 AM on December 16, 2010.
- C. Complete the surveillance no later than 8:00 AM on December 22, 2010.
- D. Complete the surveillance no later than 8:00 AM on January 15, 2011.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 97

What steps are taken to identify Post Maintenance Test requirements when performing Troubleshooting Activities per APA-ZZ-00322, APPENDIX C JOB PLANNING?

- A. The Work Planner must identify all PROBABLE Post Maintenance Test requirements during the planning.
- B. Trouble Shooting personnel are interviewed immediately following completion of their activities.
- C. A detailed log is kept of work performed during Trouble Shooting.
- D. The Operations Representative cannot authorize the Post Maintenance Testing until he/she has identified all PROBABLE Post Maintenance Testing.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 98

Plant Technical Specifications require >23 ft. of water above the top of the spent fuel storage racks during the movement of irradiated fuel in the fuel storage pool during Refueling Operations.

Which of the following is the basis for this required pool level?

- A. Limits the dose rate above the pool to < 1 mR/hr.
- B. Ensures adequate NPSH for the Fuel Pool Cooling Pumps.
- C. Limits iodine exposure for fuel handling accident.
- D. Ensures fuel remains covered for the design SFP Cooling leak.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 99

A fire adjacent to a vital area has been “confirmed”. What additional requirement must be met before an Emergency Action Level must be declared?

- A. The fire must challenge a fire barrier.
- B. The fire cannot be extinguished in 15 minutes.
- C. The fire must spread to a vital area.
- D. The fire must affect running plant equipment.

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator

Question 100

Annunciator 65C, AUCT TAVG HI, alarms.

Which of the following procedures WOULD NOT be implemented to correct the problem per OTA-RK-00020, Annunciator Response Procedure MCB Panel RK020?

- A. OTO-MA-00001, TURBINE LOAD REJECTION
- B. OTO-BB-00004, RTD CHANNEL FAILURE
- C. OTO-AC-00003, TURBINE IMPULSE PRESSURE CHANNEL FAILURE
- D. OTO-BG-00001, PRESSURIZER LEVEL CONTROL MALFUNCTION

CALLAWAY PLANT
EXAMINATION COVER SHEET
TRAINING DEPARTMENT

COURSE TITLE: 2011 INITIAL LICENSE EXAM

DATE: 2/4/2011

NAME (Print) _____

SIGNATURE: _____

Points Possible:

Points Required:

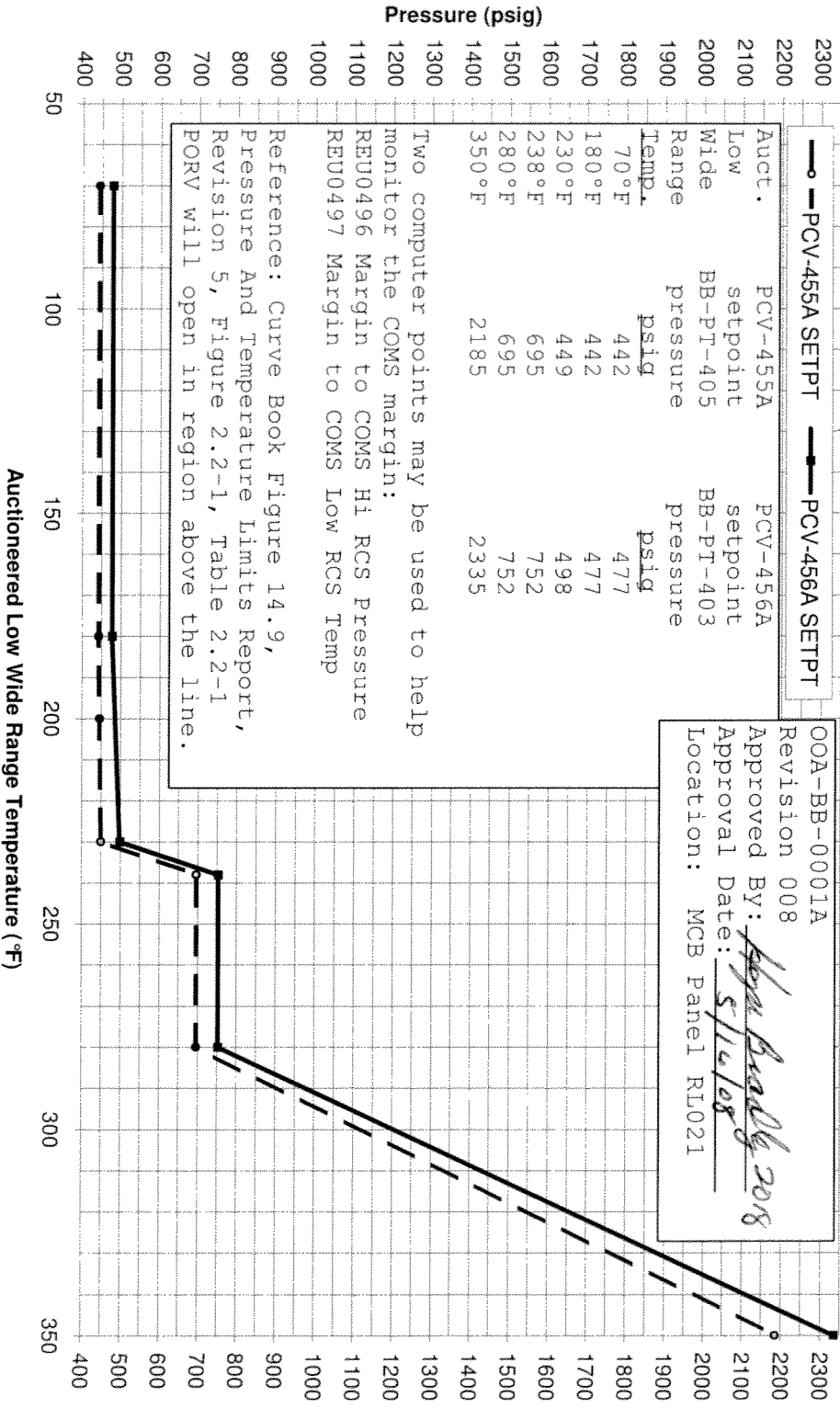
Grade:

RO	SRO	TOT
75	25	100
60	18	80

DIRECTIONS: BLACK OUT CORRECT ANSWERS

- | | | | |
|--|--|---|---|
| 1. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D | 26. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D | 51. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 76. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D |
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| 6. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 31. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D | 56. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D | 81. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D |
| 7. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 32. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D | 57. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 82. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D |
| 8. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 33. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D | 58. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D | 83. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D |
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| 14. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 39. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D | 64. <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 89. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D |
| 15. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 40. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 65. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 90. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D |
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| 20. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 45. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D | 70. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 95. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D |
| 21. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D | 46. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 71. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 96. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D |
| 22. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D | 47. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 72. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 97. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D |
| 23. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 48. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D | 73. <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 98. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D |
| 24. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D | 49. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 74. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 99. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D |
| 25. <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D | 50. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D | 75. <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D | 100. <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D |

COMS Lift Setpoint for Pressurizer PORVs



OOA-BB-0001A
 Revision 008
 Approved BY: *John Brady* 2008
 Approval Date: 5/16/08
 Location: MCB Panel RI021

Two computer points may be used to help monitor the COMS margin:
 REU0496 Margin to COMS Hi RCS Pressure
 REU0497 Margin to COMS Low RCS Temp

Reference: Curve Book Figure 14.9, Pressure And Temperature Limits Report, Revision 5, Figure 2.2-1, Table 2.2-1
 PORV will open in region above the line.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Cold Overpressure Mitigation System (COMS)

LCO 3.4.12 COMS shall be OPERABLE with a maximum of zero safety injection pumps and one centrifugal charging pump capable of injecting into the RCS and the accumulators isolated and one of the following pressure relief capabilities:

- a. Two power operated relief valves (PORVs) with lift settings within the limits specified in the PTLR, or
- b. Two residual heat removal (RHR) suction relief valves with setpoints \geq [REDACTED] psig and \leq [REDACTED] psig, or
- c. One PORV with a lift setting within the limits specified in the PTLR and one RHR suction relief valve with a setpoint \geq [REDACTED] psig and \leq [REDACTED] psig, or
- d. The RCS depressurized and an RCS vent of ≥ 2.0 square inches.

----- NOTES -----

1. Two centrifugal charging pumps may be made capable of injecting for ≤ 1 hour for pump swap operations.
 2. One or more safety injection pumps may be made capable of injecting in MODES 5 and 6 when the RCS water level is below the top of the reactor vessel flange for the purpose of protecting the decay heat removal function.
 3. Accumulator may be unisolated when accumulator pressure is less than the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.
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APPLICABILITY: MODE 4 with any RCS cold leg temperature $\leq 275^{\circ}\text{F}$,
MODE 5,
MODE 6 when the reactor vessel head is on.

ACTIONS

----- NOTE -----
 LCO 3.0.4.b is not applicable when entering MODE 4.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more safety injection pumps capable of injecting into the RCS.	A.1 Initiate action to verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	Immediately
B. Two centrifugal charging pumps capable of injecting into the RCS.	B.1 Initiate action to verify a maximum of one centrifugal charging pump is capable of injecting into the RCS.	Immediately
C. An accumulator not isolated when the accumulator pressure is greater than or equal to the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	C.1 Isolate affected accumulator.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D. Required Action and associated Completion Time of Condition C not met.</p>	<p>D.1 Increase all RCS cold leg temperatures to > 275°F.</p> <p><u>OR</u></p> <p>D.2 Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.</p>	<p>12 hours</p> <p>12 hours</p>
<p>E. One required RCS relief valve inoperable in MODE 4.</p>	<p>E.1 Restore required RCS relief valve to OPERABLE status.</p>	<p>7 days</p>
<p>F. One required RCS relief valve inoperable in MODE 5 or 6.</p>	<p>F.1 Restore required RCS relief valve to OPERABLE status.</p>	<p>24 hours</p>
<p>G. Two required RCS relief valves inoperable.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition A, B, D, E, or F not met.</p> <p><u>OR</u></p> <p>COMS inoperable for any reason other than Condition A, B, C, D, E, or F.</p>	<p>G.1 Depressurize RCS and establish RCS vent of ≥ 2.0 square inches.</p>	<p>12 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	12 hours
SR 3.4.12.2	Verify a maximum of one centrifugal charging pump is capable of injecting into the RCS.	12 hours
SR 3.4.12.3	Verify each accumulator is isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.	12 hours
SR 3.4.12.4	Verify RHR suction isolation valves are open for each required RHR suction relief valve.	72 hours
SR 3.4.12.5	Verify required RCS vent ≥ 2.0 square inches open.	12 hours for vent pathway(s) not locked, sealed, or otherwise secured in the open position <u>AND</u> 31 days for vent valve(s) locked, sealed, or otherwise secured in the open position

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	72 hours
SR 3.4.12.7	Not used.	
SR 3.4.12.8	<p>----- NOTE ----- Not required to be performed until 12 hours after decreasing any RCS cold leg temperature to $\leq 275^{\circ}\text{F}$. -----</p> <p>Perform a COT on each required PORV, excluding actuation.</p>	31 days
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	18 months