

Draft Submittal

(Pink Paper)

1. Reactor Operator Written Exam (25)
Senior Reactor Operator Written (25)
Common Written (25) & OUTLINES

SHEARON HARRIS
EXAM 2002-301

50-400
AUGUST 26 - 29, 2002

QUESTION: 1

Given the following conditions:

- The Main Turbine is operating at 1800 rpm in preparation for synchronizing to the grid.
- Reactor power is being maintained at approximately 12% using the Condenser Steam Dumps.
- Condenser Vacuum Pump 'A' is under clearance.
- Condenser Vacuum Pump 'B' trips.

Assuming **NO** operator actions, condenser vacuum degrades until ...

- a. the turbine and the reactor trip, and condenser steam dump operation is blocked
- b. the turbine trips, and condenser steam dump operation is blocked, but the reactor remains critical
- c. condenser steam dump operation is blocked, but vacuum stabilizes above the turbine trip setpoint
- d. the turbine and reactor trip, but vacuum stabilizes above the steam dumps interlock setpoint

ANSWER:

- a. the turbine and the reactor trip, and condenser steam dump operation is blocked

QUESTION: 2

Given the following conditions:

A reactor trip and safety injection have occurred.

Steam Generator parameters have decreased to the following values:

<u>SG</u>	<u>LEVEL</u>	<u>PRESSURE</u>
A	32%	870 psig
B	12%	420 psig
C	34%	830 psig

NO operator actions have been taken.

Which of the following components is mispositioned?

- a. 1FCV-2051B, MDAFW FCV to B SG, CLOSED
- b. 1FCV-2051C, MDAFW FCV to C SG, OPEN
- c. 1MS-70, MS B SG to AFW Turbine, CLOSED
- d. 1MS-72, MS C SG to AFW Turbine, OPEN

ANSWER:

- d. 1MS-72, MS C SG to AFW Turbine, OPEN

QUESTION: 3

If a Containment Ventilation Isolation (CVI) signal occurred, which of the following Containment Ventilation fans would **NOT** trip directly from the CVI signal, but would trip as a result of being interlocked with other fans?

- a. Normal Purge Supply fans (AH-82 A & B)
- b. Pre-Entry Purge Makeup fans (AH-81 A & B)
- c. Airborne Radioactivity Removal fans (S-1A & B)
- d. CNMT Pre-entry Purge Exhaust fans (E-5 A & B)

ANSWER:

- b. Pre-Entry Purge Makeup fans (AH-81 A & B)

QUESTION: 4

Hydrogen concentration in the Waste Gas System, downstream of the catalytic recombiners, is limited to 4% to ...

- a. maintain levels below flammability limits.
- b. ensure proper operation of the recombiner.
- c. limit the volume of waste gas generated.
- d. minimize the radioactive content of the waste gas decay tanks.

ANSWER:

- a. maintain levels below flammability limits.

QUESTION: 5

Given the following conditions:

- A large break LOCA has occurred.
- Containment pressure peaked at 15 psig and has decreased to 6 psig.
- Actions are being taken to place the plant in cold leg recirculation in accordance with EPP-010, "Transfer to Cold Leg Recirculation."
- Two (2) CSIPs, two (2) RHR Pumps, and two (2) Containment Spray Pumps are running.
- The crew has just completed alignment of Safety Injection for recirculation and is in the process of verifying Containment Spray alignment when the Reactor Operator notes Containment Sump level is 25%.

Which of the following actions should be taken?

- a.
 - Stop both trains of Containment Spray
 - Maintain both trains of RHR Pumps and CSIPs operating
- b.
 - Stop both trains of Containment Spray
 - Stop one (1) train of RHR Pumps and CSIPs
- c.
 - Stop one (1) train of Containment Spray
 - Stop one (1) train of RHR Pumps and CSIPs
- d.
 - Stop both trains of Containment Spray
 - Stop both trains of RHR Pumps and CSIPs

ANSWER:

- d.
 - Stop both trains of Containment Spray
 - Stop both trains of RHR Pumps and CSIPs

QUESTION: 6

Given the following conditions:

- The plant is operating at 93% power.
- Condensate Pump 1B trips on motor overcurrent.
- Condensate Booster Pump 1B trips as a result of the trip of Condensate Pump 1B.

Which of the following describes the effect of these events on the Main Feed Pumps **AND** the required operator action?

- a.
 - Main Feed Pumps 1A and 1B remain running
 - Trip the reactor and go to PATH-1
- b.
 - Main Feed Pumps 1A and 1B remain running
 - Verify a turbine runback occurs
- c.
 - Main Feed Pump 1B trips
 - Trip the reactor and go to PATH-1
- d.
 - Main Feed Pump 1B trips
 - Verify a turbine runback occurs

ANSWER:

- c.
 - Main Feed Pump 1B trips
 - Trip the reactor and go to PATH-1

QUESTION: 7

Given the following conditions:

- The plant is solid in Mode 5 with one (1) RCP in operation.
- RHR Pump A-SA is providing letdown flow with PK-145.1, LTDN PRESSURE 1CS-38, in MAN.
- CSIP A-SA is providing RCS makeup and seal injection.

If instrument air is lost to 1CS-38 (PCV-145), the operator should ...

- a. trip CSIP A-SA.
- b. trip RHR Pump A-SA.
- c. maintain letdown flow using HC-142.1, RHR Letdown 1CS-28.
- d. open one PRZ PORV.

ANSWER:

- a. trip CSIP A-SA.

QUESTION: 8

Given the following conditions:

- An I&C technician reports that both of the Control Room Normal Outside Air Intake Isolation radiation monitors have failed detectors.
- It will take somewhere between four (4) and eight (8) hours to replace the detectors.

Which of the following states the action which must be taken within one (1) hour, in accordance with Technical Specification 3.3.3.1?

- a. Establish operation of the Control Room Emergency Filtration System in the Recirculation Mode of Operation
- b. Initiate the preplanned alternate method of radiation monitoring
- c. Return the monitors to service, or be in Hot Standby within the next six (6) hours
- d. Perform a surveillance test on the Control Room Emergency Filtration System, or be in Hot Standby within the next six (6) hours

ANSWER:

- a. Establish operation of the Control Room Emergency Filtration System in the Recirculation Mode of Operation

QUESTION: 9

Given the following conditions:

- A reactor trip occurred from 75% power approximately 2 hours ago.
- The operating crew is attempting to close the Reactor Trip Breakers.
- All controls and switches are in their normal alignment for plant conditions.

Assuming all other conditions are met for closing the Reactor Trip Breakers, which of the following sets of conditions would physically allow the breakers to close when the REACTOR TRIP BREAKERS TRAINS A&B switch is taken to the CLOSE position?

- a.
 - SG 'A' level is 18%
 - IR channel N-36 is failed high
- b.
 - SG 'A' level is 18%
 - RCP 'A' is secured
- c.
 - IR channel N-36 is failed high
 - PRZ pressure is 1920 psig
- d.
 - PRZ pressure is 1920 psig
 - RCP 'A' is secured

ANSWER:

- d.
 - PRZ pressure is 1920 psig
 - RCP 'A' is secured

QUESTION: 10

The plant is in Mode 1.

Prior to entering the Personnel Air Lock, the opposite door must be closed.

How is the opposite door checked closed and what would be the consequences of attempting to enter with the opposite door open?

- a.
 - Each door contains a visual indication (red/green light) of the opposite door's position
 - Technical Specifications would be violated
- b.
 - The equalizing valve will **NOT** open if the opposite door is open
 - Technical Specifications would be violated
- c.
 - Each door contains a visual indication (red/green light) of the opposite door's position
 - An interlock will prevent entry if the opposite door is open
- d.
 - The equalizing valve will **NOT** open if the opposite door is open
 - An interlock will prevent entry if the opposite door is open

ANSWER:

- c.
 - Each door contains a visual indication (red/green light) of the opposite door's position
 - An interlock will prevent entry if the opposite door is open

QUESTION: 11

Given the following conditions:

- The Containment Spray Actuation System (CSAS) is input by the following four (4) Containment Pressure transmitters:
 - Channel I, PT-950A
 - Channel II, PT-951A
 - Channel III, PT-952A
 - Channel IV, PT-953A
- PT-950A is in TEST for surveillance testing purposes.
- PT-952A is failed low.
- A large break LOCA occurs and actual Containment Pressure reaches 21 psig.

Which of the following describes the response of the Containment Spray system?

- a. **NEITHER** train of Containment Spray will automatically actuate
- b. **ONLY** Train 'A' of Containment Spray will automatically actuate
- c. **ONLY** Train 'B' of Containment Spray will automatically actuate
- d. **BOTH** trains of Containment Spray will automatically actuate

ANSWER:

- d. **BOTH** trains of Containment Spray will automatically actuate

QUESTION: 12

Given the following conditions:

- Several Fuel Handling Building (FHB) area radiation monitors on both trains have reached the high alarm setpoint.
- AOP-005, "Radiation Monitoring System," has directed the operator to verify that the FHB ventilation has shifted to the emergency exhaust lineup.
- Both FHB Emergency Exhaust Fans, E-12 and E-13, are RUNNING.
- FHB Emergency Exhaust Fan Inlets, 1FV-2 SA and 1FV-4 SB, are OPEN

Which of the following additional alignments is expected?

- a.
 - FHB Operating Floor Supply Fans (AH-56, AH-57, AH-58, AH-59)
SECURED
 - FHB Normal Exhaust Isolation Dampers (FL-D4, FL-D5, FL-D21, FL-D22)
OPEN
- b.
 - FHB Operating Floor Supply Fans (AH-56, AH-57, AH-58, AH-59)
RUNNING
 - FHB Normal Exhaust Isolation Dampers (FL-D4, FL-D5, FL-D21, FL-D22)
OPEN
- c.
 - FHB Operating Floor Supply Fans (AH-56, AH-57, AH-58, AH-59)
RUNNING
 - FHB Normal Exhaust Isolation Dampers (FL-D4, FL-D5, FL-D21, FL-D22)
SHUT
- d.
 - FHB Operating Floor Supply Fans (AH-56, AH-57, AH-58, AH-59)
SECURED
 - FHB Normal Exhaust Isolation Dampers (FL-D4, FL-D5, FL-D21, FL-D22)
SHUT

ANSWER:

- d.
 - FHB Operating Floor Supply Fans (AH-56, AH-57, AH-58, AH-59)
SECURED
 - FHB Normal Exhaust Isolation Dampers (FL-D4, FL-D5, FL-D21, FL-D22)
SHUT

QUESTION: 13

Given the following conditions:

- A loss of offsite power has occurred with the plant at 100% power.
- The operating crew is performing the actions of EOP-EPP-001, "Loss of AC Power to 1A-SA and 1B-SB Buses."
- A SGTR has been identified in SG 'C'.
- SGs 'A' and 'B' are being depressurized to 180 psig.

Which of the following describes the method used **AND** the bases for depressurizing SGs 'A' and 'B' to 180 psig?

- a.
 - Method - Operate the SG PORVs 'A' and 'B' from the MCB
 - Bases – Lower RCS pressure below ruptured SG pressure to backfill from SG 'C' to the RCS
- b.
 - Method - Operate the SG PORVs 'A' and 'B' locally
 - Bases – Lower RCS pressure below ruptured SG pressure to backfill from SG 'C' to the RCS
- c.
 - Method - Operate the SG PORVs 'A' and 'B' from the MCB
 - Bases – Minimize RCP seal damage and RCS inventory loss
- d.
 - Method - Operate the SG PORVs 'A' and 'B' locally
 - Bases – Minimize RCP seal damage and RCS inventory loss

ANSWER:

- d.
 - Method - Operate the SG PORVs 'A' and 'B' locally
 - Bases – Minimize RCP seal damage and RCS inventory loss

QUESTION: 14

Chemistry reports that the RCS Dose Equivalent Iodine (DEI-131) activity has exceeded the limit and a shutdown is required.

The plant is to be placed in Hot Standby with T-avg less than 500°F to ...

- a. enhance the ability of the mixed bed demineralizers to remove fission products in the event of a small break LOCA.
- b. minimize the deposition of fission products and activation products on the core surfaces in the event of a large break LOCA.
- c. prevent additional fuel cladding oxidation from occurring in the event of a large break LOCA.
- d. prevent the release of radioactivity to the environment in the event of a SGTR.

ANSWER:

- d. prevent the release of radioactivity to the environment in the event of a SGTR.

QUESTION: 15

Given the following conditions:

- The plant is operating at 50% power.
- Bank 'D' Control Rods are at 140 steps.
- All control systems are in automatic and at program values.
- The Median Select ΔT Circuit output has failed high.

Which of the following will occur?

- a. ALB-020-2-1, TURBINE AUTOMATIC LOADING STOP, alarms
- b. ALB-013-8-3, BANK LO-LO INSERTION LIMIT, alarms
- c. Bank 'D' Control Rods step inward
- d. Charging flow increases

ANSWER:

- b. ALB-013-8-3, BANK LO-LO INSERTION LIMIT, alarms

QUESTION: 16

Which one of the following statements describes the reason why some selected 480-V MCC loads have two supply breakers in series?

- a. The loads are safety-related, requiring redundant train protection
- b. The loads are in Containment, requiring redundant overcurrent protection for the penetration
- c. The loads are safety-related, requiring redundant protection with different sensitivity
- d. The loads are capable of being operated from the ACP, requiring redundant control functions

ANSWER:

- b. The loads are in Containment, requiring redundant overcurrent protection for the penetration

QUESTION: 17

Given the following conditions:

- RCS boron concentration is 1900 ppm.
- Boric Acid Tank concentration is 7100 ppm.

Which of the following RWMU Flow Controller potentiometer settings will result in the **HIGHEST ACCEPTABLE** total automatic Primary Makeup System flow rate for these conditions?

- a. 5.63
- b. 6.25
- c. 6.88
- d. 7.50

ANSWER:

- c. 6.88

QUESTION: 18

Given the following conditions:

- The site has experienced a loss of offsite power.
- EDG 'A' has started and sequenced all loads.
- A valve misalignment has isolated ESW cooling to EDG 'A'.

How long can the EDG operate at full load under these conditions with **NO** adverse effects?

- a. One (1) minute
- b. Five (5) minutes
- c. Until Jacket Water Cooler Outlet temperature exceeds 185°F
- d. Until Lube Oil Cooler Outlet temperature exceeds 185°F

ANSWER:

- a. One (1) minute

QUESTION: 19

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

<u>Time</u>	<u>Ambient Temp</u>	<u>CT Basin Temp</u>
1200	35 °F	64 °F
1600	20 °F	60 °F
2000	10 °F	58 °F

Which of the following describes the correct CT Deicing Gate Valve alignment for these conditions?

- | | <u>1600</u> | <u>2000</u> |
|----|-------------|-------------|
| a. | Full Open | Full Open |
| b. | Full Open | Half Open |
| c. | Half Open | Full Open |
| d. | Half Open | Half Open |

ANSWER:

- | | | |
|----|-----------|-----------|
| b. | Full Open | Half Open |
|----|-----------|-----------|

QUESTION: 20

Given the following conditions:

- A fire has occurred in cable spread Room A - RAB 286 which requires a plant shutdown.
- 'A' SG pressure is 1000 psig.
- 'A' SG wide range level is 78%.
- 'A' SG narrow range level is unavailable.
- AFW flow is being supplied to 'A' SG.

Which of the following actions should be taken?

- a. Decrease AFW flow to lower 'A' SG wide range level to < 75%
- b. Decrease AFW flow to lower 'A' SG wide range level to < 57%
- c. Increase AFW flow to raise 'A' SG wide range level to > 57%
- d. Increase AFW flow to raise 'A' SG wide range level to > 75%

ANSWER:

- a. Decrease AFW flow to lower 'A' SG wide range level to < 75%

QUESTION: 21

Given the following conditions:

- The plant is operating at 30% power.
- All control systems are in automatic.
- T-ref fails low.

Which of the following describes the response of the rod control system?

- a. Rods initially step in at 8 steps per minute to reduce Tavg to 553°F
- b. Rods initially step in at 8 steps per minute to reduce Tavg to 557°F
- c. Rods initially step in at 72 steps per minute to reduce Tavg to 553°F
- d. Rods initially step in at 72 steps per minute to reduce Tavg to 557°F

ANSWER:

- d. Rods initially step in at 72 steps per minute to reduce Tavg to 557°F

QUESTION: 22

While establishing a bubble in the PRZ per GP-002, "Normal Plant Heatup From Cold Solid to Hot Subcritical MODE 5 to MODE 3," letdown pressure control valve 1CS-38 (PK-145.1), Low Pressure Letdown Pressure Controller, opens progressively.

Which of the following describes why PK-145.1 opens?

- a. Thermal expansion of liquid in the pressurizer
- b. Change in CCW heat load
- c. Spray valves are shut while drawing a bubble
- d. Switchover of letdown to orifices from RHR-CVCS cross-connect

ANSWER:

- a. Thermal expansion of liquid in the pressurizer

QUESTION: 23

Given the following conditions:

- A reactor trip has occurred from 28% power.
- RCS Tavg has stabilized at no-load conditions.

Which of the following describes the expected status of the Main Feed Regulating Valves and the Main FW Isolation Valves?

- a.
 - Main Feed Regulating Valves OPEN
 - Main FW Isolation Valves OPEN
- b.
 - Main Feed Regulating Valves OPEN
 - Main FW Isolation Valves CLOSED
- c.
 - Main Feed Regulating Valves CLOSED
 - Main FW Isolation Valves OPEN
- d.
 - Main Feed Regulating Valves CLOSED
 - Main FW Isolation Valves CLOSED

ANSWER:

- c.
 - Main Feed Regulating Valves CLOSED
 - Main FW Isolation Valves OPEN

QUESTION: 24

Given the following conditions:

- The plant is being heated up with RCS temperature at 280°F.
- Containment pressure is indicating (-) 0.8 inches WG.
- 1CB-2 & CB-D51 SA, Vacuum Relief 1CB-2 & CB-D51 SA, is in AUTO.
- 1CB-6 & CB-D52 SB, Vacuum Relief 1CB-6 & CB-D52 SB, is in AUTO.

Assuming **NO** operator actions, which of the following will automatically occur?

- a. 1CB-2 & CB-D51 SA will open when Containment pressure decreases to (-) 1.0 inches WG; 1CB-6 & CB-D52 SB will open if Containment pressure continues to decrease to (-) 2.25 inches WG
- b. 1CB-6 & CB-D52 SB will open when Containment pressure decreases to (-) 1.0 inches WG; 1CB-2 & CB-D51 SA will open if Containment pressure continues to decrease to (-) 2.25 inches WG
- c. 1CB-2 & CB-D51 SA and 1CB-6 & CB-D52 SB will both open when Containment pressure decreases to (-) 1.0 inches WG
- d. 1CB-2 & CB-D51 SA and 1CB-6 & CB-D52 SB will both open when Containment pressure decreases to (-) 2.25 inches WG

ANSWER:

- d. 1CB-2 & CB-D51 SA and 1CB-6 & CB-D52 SB will both open when Containment pressure decreases to (-) 2.25 inches WG

QUESTION: 25

A loss of 125 VDC bus DP-1B-SB has just occurred.

Which of the following AFW Pumps, if any, are considered inoperable?

- a. **NO** AFW pumps are inoperable
- b. **ONLY** MDAFW Pump 1B-SB is inoperable
- c. **ONLY** the TDAFW Pump is inoperable
- d. **BOTH** MDAFW Pump 1B-SB and the TDAFW Pump are inoperable

ANSWER:

- d. **BOTH** MDAFW Pump 1B-SB and the TDAFW Pump are inoperable

QUESTION: 26

Given the following conditions:

- The plant is being maintained at 1900 psig.
- RCS temperature is 500°F and stable.
- Excess letdown and normal letdown are both in service.

The following indications are noted:

- Normal letdown is 67 gpm
- RCP 1A seal injection flow is 9 gpm
- RCP 1B seal injection flow is 7 gpm
- RCP 1C seal injection flow is 8 gpm
- RCP 1A seal leakoff flow is 2.5 gpm
- RCP 1B seal leakoff flow is 2.0 gpm
- RCP 1C seal leakoff flow is 2.5 gpm

In order to maintain pressurizer level constant, charging flow should be adjusted to indicate ...

- a. 36 gpm.
- b. 43 gpm.
- c. 50 gpm.
- d. 74 gpm.

ANSWER:

- c. 50 gpm.

QUESTION: 27

Which of the following describes the start sequence of the Fire Pumps?

- a. The Motor Driven Fire Pump will only start after a 30 second time delay if the Diesel Driven Fire Pump has received a start signal and is not maintaining ≥ 100 psig.
- b. The Motor Driven Fire Pump will start at ≤ 93 psig and the Diesel Driven Fire Pump will start at ≤ 83 psig.
- c. The Diesel Driven Fire Pump will start at ≤ 93 psig and the Motor Driven Fire Pump will start at ≤ 83 psig.
- d. The Diesel Driven Fire Pump will only start after a 30 second time delay if the Motor Driven Fire Pump has received a start signal and is not maintaining ≥ 100 psig.

ANSWER:

- b. The Motor Driven Fire Pump will start at ≤ 93 psig and the Diesel Driven Fire Pump will start at ≤ 83 psig.

QUESTION: 28

Given the following conditions:

- An operator is required to complete a valve lineup in an area where the radiation level is 50 mrem/hour.
- The operator's current annual Total Effective Dose Equivalent (TEDE) is 1450 mrem.
- The operator has **NOT** received any dose outside CP&L facilities.

What is the **MAXIMUM** time that the operator may work in this area and not exceed CP&L's Annual Administrative Dose Limit?

- a. One (1) hour
- b. Eleven (11) hours
- c. Fifty-one (51) hours
- d. Seventy-one (71) hours

ANSWER:

- b. Eleven (11) hours

QUESTION: 29

Given the following:

- The unit is at 45% power.
- RCP 'B' trips.
- All SG level controllers are in AUTO.
- **NO** operator action is taken.

Which of the following describes the response of SG 'B' level?

- a. Increases to approximately 70% and stabilizes without any significant decrease in level during the transient
- b. Decreases to approximately 30% and stabilizes without any significant increase in level during the transient
- c. Increases to approximately 70% and then decreases to approximately 30% before stabilizing
- d. Decreases to approximately 30% and then increases to approximately 70% before stabilizing

ANSWER:

- d. Decreases to approximately 30% and then increases to approximately 70% before stabilizing

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Common Written Questions**

QUESTION: 30

Given the following conditions:

- Shortly following a loss of offsite power, the following indications are noted on Train 'A' Emergency Safeguards Sequencer (ESS) light box:

<u>CNMT FAN HIGH AH-2A</u>	<u>CNMT FAN HIGH AH-2B</u>	<u>CNMT FAN LOW AH-2A</u>	<u>CNMT FAN LOW AH-2B</u>	<u>SW BSTR PUMP START A</u>
LIT	OFF	OFF	OFF	LIT

- Prior to AUTO ACT COMPLETE MAN LOAD PERMITTED (Load Block 9) lighting, a steam break occurs inside Containment, causing a Safety Injection.

Following completion of the sequencer, which of the following indications would be expected on the Train 'A' ESS light box?

	<u>CNMT FAN HIGH AH-2A</u>	<u>CNMT FAN HIGH AH-2B</u>	<u>CNMT FAN LOW AH-2A</u>	<u>CNMT FAN LOW AH-2B</u>	<u>SW BSTR PUMP START A</u>
a.	LIT	LIT	OFF	OFF	LIT
b.	LIT	LIT	OFF	OFF	OFF
c.	OFF	OFF	LIT	OFF	LIT
d.	OFF	OFF	LIT	OFF	OFF

ANSWER:

c.	OFF	OFF	LIT	OFF	LIT
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QUESTION: 31

Given the following conditions:

- A reactor trip and safety injection occurred several minutes ago.
- A loss of offsite power has just occurred.
- Both 6.9 KV buses 1A-SA and 1B-SB are being supplied by the diesel generators.

Which of the following components has **NO** power available?

- a. Containment Fan Cooler AH-1
- b. Containment Fan Coil Unit AH-37A
- c. Primary Shield Cooling Fan S-2A
- d. Reactor Support Cooling Fan S-4A

ANSWER:

- b. Containment Fan Coil Unit AH-37A

QUESTION: 32

Given the following plant conditions:

- The plant is operating at 100% power.
- 1CS-7, 45 GPM Letdown Orifice A, and 1CS-8, 60 GPM Letdown Orifice B, are closed.
- 1CS-9, 60 GPM Letdown Orifice C, is open.
- The Reactor Makeup System is setup properly and is in AUTO.
- VCT level transmitter, LT-112, fails high.

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

- a. Charging Pump suction is eventually lost as VCT level decreases
- b. 1CS-120 (LCV-115A), Letdown VCT/Hold Up Tank, aligns to the VCT and **NO** automatic makeup will occur
- c. 1CS-120 (LCV-115A), Letdown VCT/Hold Up Tank, aligns to the HUT and a **CONTINUOUS** makeup to the VCT will occur
- d. 1CS-120 (LCV-115A), Letdown VCT/Hold Up Tank, aligns to the HUT and **INTERMITTENT** makeups at normal setpoints will occur

ANSWER:

- d. 1CS-120 (LCV-115A), Letdown VCT/Hold Up Tank, aligns to the HUT and **INTERMITTENT** makeups at normal setpoints will occur

QUESTION: 33

Given the following conditions:

- CCW Pump 'A' needs to be removed from service for motor replacement.
- CCW Pump 'C' is being aligned to replace CCW Pump 'A'.

Which of the following describes the reason for the Kirk Key interlock associated with CCW Pump 'C'?

- a. Prevent aligning CCW Pumps 'A' and 'C' to 6.9 KV Bus 1A-SA simultaneously
- b. Prevent aligning CCW Pump 'C' to 6.9 KV Buses 1A-SA and 1B-SB simultaneously
- c. Ensure CCW Pump 'C' is racked into the proper 6.9 KV Bus
- d. Ensure CCW Pump 'C' breaker does **NOT** auto close while being racked in

ANSWER:

- a. Prevent aligning CCW Pumps 'A' and 'C' to 6.9 KV Bus 1A-SA simultaneously

QUESTION: 34

Given the following conditions:

- The plant is currently operating at 30% power.
- RCS boron concentration is 900 ppm.
- Core burnup is 300 EFPD.
- Control Bank 'D' rods are inadvertently withdrawn from 135 steps to 155 steps.

BEFORE RCS temperature increases in response to the rod withdrawal, reactor power will increase from 30% to approximately ...

- a. 32%.
- b. 36%.
- c. 40%.
- d. 44%.

ANSWER:

- b. 36%.

QUESTION: 35

Given the following conditions:

- The plant is operating at 68% power.
- Control Bank D, Group 1, step counter indicates 187 steps.
- Control Bank D, Group 2, step counter indicates 187 steps.
- Control Bank D rod heights are as follows:

<u>Group 1 Rod</u>	<u>Steps</u>
H2	186
B8	186
H14	192
P8	180

<u>Group 2 Rod</u>	<u>Steps</u>
F6	186
F10	198
K10	186
K6	180

Which of the following describes the action, if any, that must be taken within one (1) hour for these conditions?

- a. **NO** actions are required
- b. Realign rods F6 and K6 within 12 steps of each other
- c. Reduce power below 50%
- d. Determine the position of the rods using the movable incore detectors

ANSWER:

- a. **NO** actions are required

QUESTION: 36

Given the following conditions:

- The AutoLog is **NOT** functioning.
- The Reactor Operator is maintaining a manual log.

The following log entries have been made:

- 0956 B-SB CSIP trip
- 1005 Started A-SA CSIP per AOP-018
- 1011 Established normal letdown

At 1030, the Reactor Operator realizes he forgot to make a 0957 entry that letdown had been isolated.

Which of the following entries would be a proper entry in accordance with OMM-016, Operator Logs?

- a. *1030 Isolated normal letdown
- b. L.E. 1030 Isolated normal letdown
- c. *0957 Isolated normal letdown
- d. L.E. 0957 Isolated normal letdown

ANSWER:

- d. L.E. 0957 Isolated normal letdown

QUESTION: 37

Given the following conditions:

- Following a large break LOCA, a transition has been made from EPP PATH-1 to EPP-010, "Transfer to Cold Leg Recirculation."
- The operator attempts to open 1RH-25, RHR A to Charging Pump Suction Valve, and 1RH-63, RHR B to Charging Pump Suction Valve.
- 1RH-25 opens, but 1RH-63 fails to open.

Which of the following describes a condition that prevents 1RH-63 from opening **AND** the actions that should be taken?

- a.
 - 1CS-752, CSIP 'B' Alternate Miniflow, failed to close.
 - Maintain RHR Train 'B' aligned for Cold Leg Injection until RWST level decreases to 3% and then secure RHR Train 'B'.
- b.
 - 1SI-301, CNMT Sump to RHR Pump 'B' Suction, failed to open.
 - Maintain RHR Train 'B' aligned for Cold Leg Injection until RWST level decreases to 3% and then secure RHR Train 'B'.
- c.
 - 1CS-752, CSIP 'B' Alternate Miniflow, failed to close.
 - Close 1CS-753, CSIP 'B' Alternate Miniflow Isolation, and open 1RH-63, RHR B to Charging Pump Suction Valve.
- d.
 - 1SI-301, CNMT Sump to RHR Pump 'B' Suction, failed to open.
 - Open 1SI-311, CNMT Sump to RHR Pump 'B' Suction, and open 1RH-63, RHR B to Charging Pump Suction Valve.

ANSWER:

- c.
 - 1CS-752, CSIP 'B' Alternate Miniflow, failed to close.
 - Close 1CS-753, CSIP 'B' Alternate Miniflow Isolation, and open 1RH-63, RHR B to Charging Pump Suction Valve.

QUESTION: 38

Given the following conditions:

- The plant is operating at 100% power.
- Spent fuel is being moved in Spent Fuel Pool 'B'.
- The suction pipe from Spent Fuel Pool 'B' to the Spent Fuel Pool Cooling Pump completely severs.

Level in the Spent Fuel Pool will decrease and stabilize at ...

- a. 18 feet above the fuel assemblies. Makeup should be initiated using AOP-013, "Fuel Handling Accident."
- b. 18 feet above the fuel assemblies. Makeup should be initiated using OP-116, "Fuel Pool Cooling System."
- c. 21 feet above the fuel assemblies. Makeup should be initiated using AOP-013, "Fuel Handling Accident."
- d. 21 feet above the fuel assemblies. Makeup should be initiated using OP-116, "Fuel Pool Cooling System."

ANSWER:

- b. 18 feet above the fuel assemblies. Makeup should be initiated using OP-116, "Fuel Pool Cooling System."

QUESTION: 39

Given the following conditions:

- The plant has tripped from 100% power due to a trip of 'B' RCP.
- 'A' and 'C' RCPs are running.

Which of the following is the expected RVLIS Dynamic Head indication?

- a. 36%
- b. 41%
- c. 63%
- d. 100%

ANSWER:

- c. 63%

QUESTION: 40

Given the following conditions:

- The plant is operating at 40% power.
- AOP-005, "Radiation Monitoring System," has been entered.
- REM-1WC-3544, WPB CCW HX Inlet Monitor, is in HIGH alarm.

As a result of the high alarm, which of the following will automatically close?

- a. 1CC-252, RCP Thermal Barrier Flow Control Valve
- b. 3WC-4, WPB CCW Surge Tank Overflow Valve
- c. 1CC-304, CCW to Gross Failed Fuel Detector
- d. 3WC-7, WPB CCW Surge Tank Drain Valve

ANSWER:

- b. 3WC-4, WPB CCW Surge Tank Overflow Valve

QUESTION: 41

The following post-SGTR cooldown procedures all cooldown and depressurize the RCS to RHR conditions:

- EPP-017, "Post SGTR Cooldown Using Backfill"
- EPP-018, "Post SGTR Cooldown Using Blowdown"
- EPP-019, "Post SGTR Cooldown Using Steam Dump"

Which of the following describe how the depressurization and cooldown in EPP-017 differs from that in EPP-018 and EPP-019?

- a.
 - EPP-017 maintains RCS pressure above the ruptured SG pressure
 - EPP-018 and EPP-019 maintain RCS pressure the same as the ruptured SG pressure
- b.
 - EPP-017 maintains RCS pressure below the ruptured SG pressure
 - EPP-018 and EPP-019 maintain RCS pressure the same as the ruptured SG pressure
- c.
 - EPP-017 maintains RCS pressure the same as the ruptured SG pressure
 - EPP-018 and EPP-019 maintain RCS pressure above the ruptured SG pressure
- d.
 - EPP-017 maintains RCS pressure the same as the ruptured SG pressure
 - EPP-018 and EPP-019 maintain RCS pressure below the ruptured SG pressure

ANSWER:

- b.
 - EPP-017 maintains RCS pressure below the ruptured SG pressure
 - EPP-018 and EPP-019 maintain RCS pressure the same as the ruptured SG pressure

QUESTION: 42

Given the following conditions:

- A Control Bank 'D' rod has dropped into the core while operating at 100% power.
- The operating crew has reduced power to 74%.
- Three (3) hours later, they are attempting to withdraw the dropped rod.

In accordance with AOP-001, "Malfunction of Rod Control and Indication System," to maintain programmed T_{avg} while recovering the dropped rod ...

- a. raise turbine load.
- b. reduce turbine load.
- c. borate the RCS.
- d. dilute the RCS.

ANSWER:

- a. raise turbine load.

QUESTION: 43

The plant is in Mode 1.

VCT pressure has decreased to 8 psig.

Which of the following is the effect on the plant?

- a. VCT water flashes to steam
- b. Insufficient cooling is available to the No. 2 RCP seals
- c. Insufficient seal injection is available to the RCPs
- d. CSIPs begin cavitating due to gas binding

ANSWER:

- b. Insufficient cooling is available to the No. 2 RCP seals

QUESTION: 44

Given the following conditions:

- A plant startup is being performed per GP-005, "Power Operation (MODE 2 to MODE 1)."
- The SG PORVs controllers are set at 87%.
- The Steam Dump Controller has been incorrectly set at 89%.

While preparing to latch the Main Turbine, RCS temperature will be maintained at approximately ...

- a. 553°F.
- b. 557°F.
- c. 562°F.
- d. 564°F.

ANSWER:

- c. 562°F.

QUESTION: 45

Given the following conditions:

- The plant is operating at 100% power when a high radiation condition occurs inside containment.
- RC-3561A, Containment Ventilation Isolation radiation monitor (Train A), goes into high (RED) alarm.
- RC-3561B, Containment Ventilation Isolation radiation monitor (Train B), is out-of-service for testing.
- RC-3561C, Containment Ventilation Isolation radiation monitor (Train A), does NOT respond to the high radiation condition.
- RC-3561D, Containment Ventilation Isolation radiation monitor (Train B), goes into high (RED) alarm.

Which train(s) of Containment Ventilation Isolation will actuate, if any?

- a. Neither Train 'A' nor 'B'
- b. Train 'A' only
- c. Train 'B' only
- d. Both Train 'A' and 'B'

ANSWER:

- d. Both Train 'A' and 'B'

QUESTION: 46

Given the following conditions:

- The unit is in Mode 4, performing a cooldown on RHR.
- Both trains of CCW are in service.
- NSW Pump 'A' is operating.
- NSW Pump 'B' is in standby.
- Both ESW Pumps are available, but are **NOT** running.
- NSW Pump 'A' experiences a sheared shaft.

Which of the following automatically occurs **AND** what is the effect on the plant cooldown?

- a.
 - ESW aligns on a low flow signal to cool Train 'A' CCW **ONLY**
 - Train 'B' RHR and CCW must be secured.
- b.
 - ESW aligns on a low flow signal to cool **BOTH** trains of CCW.
 - Neither train of RHR and CCW must be secured.
- c.
 - ESW aligns on a low pressure signal to cool Train 'A' CCW **ONLY**.
 - Train 'B' RHR and CCW must be secured.
- d.
 - ESW aligns on a low pressure signal to cool **BOTH** trains of CCW.
 - Neither train of RHR and CCW must be secured.

ANSWER:

- d.
 - ESW aligns on a low pressure signal to cool **BOTH** trains of CCW.
 - Neither train of RHR and CCW must be secured.

QUESTION: 47

Which of the following conditions would permit securing Containment Spray per EOP-PATH-1 Guide?

- a.
 - Actuation caused by a LOCA
 - Time since LOCA occurred is 6 hours
 - Containment pressure is 9 psig
- b.
 - Actuation caused by a LOCA
 - Time since LOCA occurred is 3 hours
 - Containment pressure is 5 psig
- c.
 - Actuation caused by a Steam Line Break
 - Time since Steam Line Break occurred is 3 hours
 - Containment pressure is 5 psig
- d.
 - Actuation caused by a Steam Line Break
 - Time since Steam Line Break occurred is 6 hours
 - Containment pressure is 9 psig

ANSWER:

- c.
 - Actuation caused by a Steam Line Break
 - Time since Steam Line Break occurred is 3 hours
 - Containment pressure is 5 psig

QUESTION: 48

Given the following conditions:

- The plant is in Mode 3 with Tavg at 557°F.
- All systems are in their normal alignment.
- Safety Injection is manually actuated inadvertently.

Which of the following describes the impact on Instrument Air inside Containment?

- a.
 - IA-819, Containment Instrument Air, closes
 - SI and Phase A must **BOTH** be reset to allow opening IA-819
- b.
 - IA-819, Containment Instrument Air, closes
 - **ONLY** SI must be reset to allow opening IA-819
- c.
 - IA-819, Containment Instrument Air, closes
 - **ONLY** Phase A must be reset to allow opening IA-819
- d.
 - IA-819, Containment Instrument Air, remains open
 - **NO** actions are required to be taken to restore IA to Containment

ANSWER:

- c.
 - IA-819, Containment Instrument Air, closes
 - **ONLY** Phase A must be reset to allow opening IA-819

QUESTION: 49

Given the following conditions:

- The unit is operating at 100% power.
- A turbine trip occurs.

Assuming **NO** operator actions, which of the following describes the expected **FINAL CONDITION** of SG pressure and Turbine First Stage Impulse Pressure as compared to the 100% power conditions?

- a.
 - SG pressure **INCREASES**
 - Turbine First Stage Impulse Pressure **INCREASES**
- b.
 - SG pressure **INCREASES**
 - Turbine First Stage Impulse Pressure **DECREASES**
- c.
 - SG pressure **DECREASES**
 - Turbine First Stage Impulse Pressure **INCREASES**
- d.
 - SG pressure **DECREASES**
 - Turbine First Stage Impulse Pressure **DECREASES**

ANSWER:

- b.
 - SG pressure **INCREASES**
 - Turbine First Stage Impulse Pressure **DECREASES**

QUESTION: 50

Given the following conditions:

- A reactor trip occurred due to a loss of offsite power.
- The plant is being cooled down on RHR per EPP-006, "Natural Circulation Cooldown with Steam Void in Vessel with RVLIS."
- RCS cold leg temperatures are 190°F.
- Steam generator pressures are 50 psig.
- RVLIS upper range indicates greater than 100%.
- Three CRDM fans have been running during the entire cooldown.

Steam should be dumped from all SGs to ensure ...

- a. boron concentration is equalized throughout the RCS prior to taking a sample to verify cold shutdown boron conditions.
- b. all inactive portions of the RCS are below 200°F prior to complete RCS depressurization.
- c. RCS and SG temperatures are equalized prior to any subsequent RCP restart.
- d. RCS temperatures do not increase during the required 29 hour vessel soak period.

ANSWER:

- b. all inactive portions of the RCS are below 200°F prior to complete RCS depressurization.

QUESTION: 51

Given the following conditions:

- During a reactor startup, power has been stabilized at 10^{-8} amps.
- Main Feed Pump 'A' is operating and maintaining SG levels at program level.
- Main Feed Pump 'B' is secured.
- Subsequently, SG 'B' level increases to 85%.

Which of the following is the expected status of the following pumps?

- a.
 - Main Feed Pump 'A' RUNNING
 - Motor Driven AFW Pumps OFF
 - Turbine Driven AFW Pump OFF
- b.
 - Main Feed Pump 'A' OFF
 - Motor Driven AFW Pumps RUNNING
 - Turbine Driven AFW Pump OFF
- c.
 - Main Feed Pump 'A' OFF
 - Motor Driven AFW Pumps OFF
 - Turbine Driven AFW Pump RUNNING
- d.
 - Main Feed Pump 'A' OFF
 - Motor Driven AFW Pumps RUNNING
 - Turbine Driven AFW Pump RUNNING

ANSWER:

- b.
 - Main Feed Pump 'A' OFF
 - Motor Driven AFW Pumps RUNNING
 - Turbine Driven AFW Pump OFF

QUESTION: 52

Given the following conditions:

- A loss of offsite power has occurred.
- Both Emergency Diesel Generators are loaded.
- ALB-024-3-2, DIESEL GENERATOR A TROUBLE, alarms.
- An operator is sent to investigate and reports the following conditions:
 - Turbo Oil Press 28 psig and stable
 - Lube Oil Press 30 psig and stable
 - Fuel Oil Press 1.5 psig and stable
 - Day Tank Level 56% and slowly decreasing
 - Starting Air Pressure 227 psig and slowly decreasing
 - Jacket Water Pressure 17 psig and stable
 - Control Air Pressure 53 psig and stable

Which of the following components should have automatically started based on these conditions?

- a. Lube Oil Circulating Pump
- b. Auxiliary Lube Oil Pump
- c. Fuel Oil Transfer Pump
- d. Starting Air Compressor

ANSWER:

- b. Auxiliary Lube Oil Pump

QUESTION: 53

Given the following conditions:

- PRZ pressure is 1685 psig.
- PRT pressure is 15 psig.

Which of the following indications support a diagnosis that a PRZ PORV is stuck open?

	<u>PRZ LEVEL</u>	<u>TEMP DOWNSTREAM OF PORV</u>
a.	Increasing	613°F
b.	Increasing	250°F
c.	Decreasing	613°F
d.	Decreasing	250°F

ANSWER:

- | | | |
|----|------------|-------|
| b. | Increasing | 250°F |
|----|------------|-------|

QUESTION: 54

Given the following conditions:

- A Reactor Startup is being performed.
- Initial Source Range Count Rate was 200 count per second (cps).
- 2500 pcm has been inserted into the core by withdrawing control rods and Source Range Count Rate has increased to 400 cps.
- Rod withdrawal is continued, and an additional 1250 pcm is added to the core.

Which of the following identifies the approximate condition of the core?

- a. The reactor is subcritical with a stable count rate of 500 cps
- b. The reactor is subcritical with a stable count rate of 600 cps
- c. The reactor is subcritical with a stable count rate of 800 cps
- d. The reactor is critical with an increasing count rate

ANSWER:

- c The reactor is subcritical with a stable count rate of 800 cps

QUESTION: 55

During a plant cooldown and depressurization in preparation for a refueling, the SIS Accumulators are depressurized and then drained.

The normal drain path for the SIS Accumulators is through the Reactor Coolant Drain Tank ...

- a. to the Recycle Holdup Tank.
- b. to the Waste Holdup Tank.
- c. via the Spent Fuel Pool Cooling System to the Refueling Water Storage Tank.
- d. via the Spent Fuel Pool Cooling System to the Transfer Canal.

ANSWER:

- a. to the Recycle Holdup Tank.

QUESTION: 56

Given the following conditions:

- The plant is in Hot Standby.
- Letdown flow is 105 gpm.
- CSIP 'B' is operating.
- A loss of 125 VDC Emergency Bus DP-1B-SB occurs.

With **NO** operator actions, which of the following is the response of the plant?

- a. Seal injection will be lost
- b. Charging pump suction will shift to the RWST
- c. Letdown line flashing will occur
- d. RCS inventory will be lost

ANSWER:

- d. RCS inventory will be lost

QUESTION: 57

Which of the following sets of conditions would require that the Reactor Coolant Pumps be secured?

- a.
 - RCS is currently at 525°F during a plant heatup
 - Operating CSIP has tripped
 - CCW Heat Exchanger outlet temperature is 95°F
 - ALB-5-1-2B, RCP THERM BAR HDR LOW FLOW, is **NOT** alarming

- b.
 - RCS is currently at 375°F during a plant heatup
 - Operating CSIP has tripped
 - CCW Heat Exchanger outlet temperature is 112°F
 - ALB-5-1-2B, RCP THERM BAR HDR LOW FLOW, is alarming

- c.
 - RCS is currently at 525°F during a plant heatup
 - CSIP 'A' is operating
 - CCW Heat Exchanger outlet temperature is 108°F
 - ALB-5-1-2B, RCP THERM BAR HDR LOW FLOW, is **NOT** alarming

- d.
 - RCS is currently at 375°F during a plant heatup
 - CSIP 'A' is operating
 - CCW Heat Exchanger outlet temperature is 122°F
 - ALB-5-1-2B, RCP THERM BAR HDR LOW FLOW, is alarming

ANSWER:

- b.
 - RCS is currently at 375°F during a plant heatup
 - Operating CSIP has tripped
 - CCW Heat Exchanger outlet temperature is 112°F
 - ALB-5-1-2B, RCP THERM BAR HDR LOW FLOW, is alarming

QUESTION: 58

Given the following conditions:

- A loss of offsite power has occurred.
- SG levels are being maintained constant using AFW in manual control.
- ERFIS is **NOT** available.
- SG pressures are at 885 psig and decreasing slowly.
- RCS pressure is 1935 psig and stable.
- Core exit thermocouples are 624°F and stable.
- RCS hot leg temperatures are 605°F and stable.
- RCS cold leg temperatures are 532°F and decreasing slowly.

The operator is verifying natural circulation flow in EPP-004, "Reactor Trip Response."

Which of the following describes the status of natural circulation flow per EPP-004?

- a. The natural circulation criteria of EPP-004 has been met
- b. RCS cold leg temperature criteria has **NOT** been met
- c. RCS hot leg temperature criteria has **NOT** been met
- d. RCS subcooling criteria has **NOT** been met

ANSWER:

- d. RCS subcooling criteria has **NOT** been met

QUESTION: 59

Which of the following would require that Independent Verification be performed in accordance with OPS-NGGC-1303, "Independent Verification?"

- a. During Mode 5, a valve in the Containment Spray system is being repositioned for testing and the OP lineup will be completed prior to Mode 4 entry
- b. During Mode 1, a valve in the Main Steam system is being placed under clearance and the valve is only accessible with a manlift
- c. During Mode 4, a valve in CVCS inside containment is being positioned for draining and the valve is located in an area where the temperature is 134°F
- d. During Mode 3, a valve in CVCS is being placed under clearance and the valve is located in a radiation field of 175 mRem/hr with an estimated verification time of 6 minutes

ANSWER:

- b. During Mode 1, a valve in the Main Steam system is being placed under clearance and is only accessible with a manlift

QUESTION: 60

Given the following conditions:

- Train 'A' RHR has just been placed in service in accordance with GP-007, "Normal Plant Cooldown MODE 3 to MODE 5."
- Train 'B' RHR is still aligned for ECCS Mode.
- Interlock P-12 has been bypassed and the Condenser Steam Dumps are in operation.
- Train 'A' equipment is in operation.
- Both CSIPs are still available.
- RCP 'C' has been secured for the cooldown.

A loss of 6.9 KV Bus 1A-SA occurs and EDG 1A-SA fails to start.

Which of the following describes the impact of the loss of Bus 1A-SA on the plant?

- a. TDAFW Pump becomes inoperable
- b. RCPs 'A' and 'B' must be secured
- c. RHR cooling capability is temporarily lost
- d. Condenser steam dump capability is lost

ANSWER:

- c. RHR cooling capability is temporarily lost

QUESTION: 61

Given the following conditions:

- FRP-P.1, "Response to Imminent Pressurized Thermal Shock," is being performed.
- Safety Injection **CANNOT** be terminated due to inadequate RCS subcooling.
- However, RCS subcooling is adequate to start an RCP.

Which of the following describes the bases for RCP operation under these conditions?

- a. Provide additional RCS subcooling
- b. Provide mixing of injection water and reactor coolant
- c. Supply additional heat input into the RCS
- d. Provides normal sprays for the depressurization

ANSWER:

- b. Provide mixing of injection water and reactor coolant

QUESTION: 62

Given the following conditions:

- REM-3502A, Containment RCS Leak Detection Radiation monitor, is in service.
- REM-3502B, Containment Pre-Entry Purge Radiation monitor, is in service.

Which of the following describes the effect on these monitors if a Containment Isolation Phase 'A' actuation occurs?

- a.
 - REM-3502A remains in service
 - REM-3502B remains in service
- b.
 - REM-3502A remains in service
 - REM-3502B is isolated
- c.
 - REM-3502A is isolated
 - REM-3502B remains in service
- d.
 - REM-3502A is isolated
 - REM-3502B is isolated

ANSWER:

- c.
 - REM-3502A is isolated
 - REM-3502B remains in service

QUESTION: 63

Given the following conditions:

- A LOCA has occurred inside Containment, resulting in a reactor trip and a safety injection.
- A transition has just been made from EPP PATH-1 to FRP-P.1, "Response to Imminent Pressurized Thermal Shock."
- Containment pressure is 7 psig and increasing slowly.
- All RCPs have been secured.
- Pressurizer level is off-scale low.
- RVLIS Full Range indicates 88%.
- Core exit thermocouples are 240°F and decreasing
- RCS cold leg temperatures are 230°F and decreasing.
- RCS pressure is 285 psig and stable.
- ERFIS indicates subcooling is 177°F.
- RHR HX header flows are both 0 gpm.
- SG levels are as follows:

<u>SG</u>	<u>LEVEL</u>
A	32%
B	10%
C	26%

Which of the following actions should be taken in accordance with FRP-P.1, "Response to Imminent Pressurized Thermal Shock?"

- a. Maintain total AFW flow > 210 KPPH until at least one (1) SG is > 40% level
- b. Secure AFW flow to all SGs
- c. Maintain cold leg injection flow, but secure one (1) CSIP
- d. Return to EOP-PATH-1

ANSWER:

- a. Maintain total AFW flow > 210 KPPH until at least one (1) SG is > 40% level

QUESTION: 64

Given the following conditions:

- A loss of secondary heat sink has occurred.
- Attempts are made to restore main feedwater using FRP-H.1, "Response to Loss of Secondary Heat Sink."
- All RCPs are stopped.
- SG level wide range levels are all below 5%.
- Core exit thermocouple temperatures are increasing.
- PRZ pressure is 2180 psig and increasing rapidly.

Which of the following describes the sequence of actions to be taken?

- a.
 - Actuate Safety Injection
 - Verify all PRZ PORVs automatically open when pressure increases
- b.
 - Actuate Safety Injection
 - Open all PRZ PORVs after verifying Safety Injection flowpath
- c.
 - Open all PRZ PORVs
 - Verify Safety Injection automatically actuates when pressure decreases
- d.
 - Open all PRZ PORVs
 - Actuate Safety Injection after verifying the PRZ PORVs are open

ANSWER:

- b.
 - Actuate Safety Injection
 - Open all PRZ PORVs after verifying Safety Injection flowpath

QUESTION: 65

Given the following conditions:

- Reactor power is 8%.
- The turbine is at 1800 rpm, in preparations for synchronizing to the grid.
- A reactor trip occurs.

Which of the following describes why the Main Turbine must be tripped under these conditions?

- a. Prevent an uncontrolled RCS cooldown
- b. Generate an additional reactor trip signal
- c. Minimize the depletion of SG inventory
- d. Minimize the pressure increase in the RCS

ANSWER:

- a. Prevent an uncontrolled RCS cooldown

QUESTION: 66

Given the following conditions:

- PRZ pressure is being controlled in automatic at 2235 psig.
- Pressure transmitter PT-444 fails high.
- Approximately 10 seconds after the failure, the operator places PK-444A in MANUAL.

Which of the following actions is the operator required to take to restore PRZ pressure to 2235 psig?

- a. Raise controller output to cause heaters to energize and spray valves to close
- b. Raise controller output to cause spray valves to open and heaters to deenergize
- c. Lower controller output to cause heaters to energize and spray valves to close
- d. Lower controller output to cause spray valves to open and heaters to deenergize

ANSWER:

- c. Lower controller output to cause heaters to energize and spray valves to close

QUESTION: 67

The plant is in Mode 3 with the Shutdown Banks withdrawn when the following events occur:

- The reactor trip breakers open.
- ALB-15-1-4, 60 KVA UPS TROUBLE, is **NOT** alarming.
- ALB-15-1-5, 7.5 KVA UPS TROUBLE, is **NOT** alarming.
- ALB-15-2-2, PIC 1-2-3-4-9-10-13-14 POWER FAILURE, alarms.
- ALB-15-3-2, PIC 5-6-7-8-11-12-15-16 POWER FAILURE, is **NOT** alarming.
- ALB-15-4-3, PIC 17-18 POWER FAILURE, alarms.
- ALB-15-5-3, PIC 19 POWER FAILURE, is **NOT** alarming.
- Most lights in the top row of Trip Status Light Boxes are energized.
- Several lights in each of the other rows of Trip Status Light Boxes are energized.

Which of the following buses have been lost?

- a. Instrument Bus S-I
- b. Instrument Bus S-II
- c. UPS Bus UPP-1A
- d. UPS Bus UPP-1B

ANSWER:

- a. Instrument Bus S-I

QUESTION: 68

Given the following conditions:

- The crew diagnosed a SG tube leak.
- REM-1BD-3527, Steam Generator Blowdown, went into high (RED) alarm.
- In response to the alarm on REM-1BD-3527, the crew performed the required actions of AOP-016, "Excessive Primary Plant Leakage," Attachment 1, "Primary-To-Secondary Leak."

Which of the following describes the expected indicated trend on REM-1BD-3527 after the completion of Attachment 1?

- a. Stabilizes and then decreases
- b. Continues to indicate current SG radiation levels
- c. Increases to full scale
- d. Stabilizes and then increases

ANSWER:

- a. Stabilizes and then decreases

QUESTION: 69

Given the following conditions:

- FRP-C.1, "Response to Inadequate Core Cooling," is being performed following a small break LOCA.
- Containment pressure is 8.5 psig.
- Core exit thermocouples are >1400°F.
- All efforts to establish SI flow have failed.
- The crew has started RCP 'C' in an attempt to lower core exit temperatures, but temperatures have remained above 1300°F.
- SG 'C' level is 55%.
- SGs 'A' and 'B' are off-scale low.

Which of the following actions should be taken?

- a. Open the PRZ PORVs and RCS vent valves
- b. Start RCPs 'A' and 'B' one at a time
- c. Close any open PRZ PORVs and RCS vent valves
- d. Refill and repressurize the SI Accumulators for continued injection

ANSWER:

- a. Open the PRZ PORVs and RCS vent valves

QUESTION: 70

Given the following conditions:

- The unit is in the Source Range during a reactor startup.
- Power is lost to Instrument Bus S-III.
- A reactor trip occurs.

Which of the following signals will cause a reactor trip?

- a. Source Range High Count Rate
- b. Intermediate Range High Flux
- c. Power Range Neutron Flux (Low Setpoint)
- d. Turbine Trip

ANSWER:

- d. Turbine Trip

QUESTION: 71

After plant control is completely shifted to the Auxiliary Control Panel in accordance with AOP-004, "Remote Shutdown", which of the following actions will the operators have to manually perform?

- a. Align CSIP suction to the RWST
- b. Transfer control of the EDGs to the local control panels
- c. Open the reactor trip breakers
- d. Block SIAS to the Emergency Sequencers

ANSWER:

- a. Align CSIP suction to the RWST

QUESTION: 72

Given the following conditions:

- During a plant startup, Main Feed Water is aligned to the SGs through the Feed Reg Valve Bypass FCVs.
- The controller for FCV-479, SG 'A' Feed Reg Valve Bypass FCV (FK-479.1), has just been placed in AUTO.
- The controller for FCV-489, SG 'B' Feed Reg Valve Bypass FCV (FK-489.1), is still in MANUAL.
- The controller for FCV-499, SG 'C' Feed Reg Valve Bypass FCV (FK-499.1), is still in MANUAL.
- FCV-479 begins going open.

Which of the following failures could have caused the response of FCV-479?

- a. SG 'A' Feed Flow Channel FT-475 failing low
- b. SG 'A' Steam Flow Channel FT-476 failing high
- c. SG 'A' Level Channel LT-476 failing high
- d. Power Range Channel N-44 failing high

ANSWER:

- d. Power Range Channel N-44 failing high

QUESTION: 73

Which of the following describes why RCP trip criteria is included in PATH-2?

- a. Protect against operator misdiagnosis since RCS pressure should not decrease to the trip criteria during a SGTR
- b. Decrease leakage from the RCS since the total leakage for the duration of the SGTR is less than it would have been with the RCPs in service
- c. Prevent heatup of the RCS since a heatup of the RCS due to the RCPs being in service increases leakage to the ruptured SG
- d. Protect the RCPs from operating with inadequate ΔP across the number one RCP seal as a result of the RCS depressurization from the SGTR

ANSWER:

- a. Protect against operator misdiagnosis since RCS pressure should not decrease to the trip criteria during a SGTR

QUESTION: 74

Which of the following describes how the Emergency Sequencer is reset following a loss of AC power to 6.9 KV Bus 1A-SA which results in actuation of the Sequencer UV Program?

- a. The operator resets the program by turning the SI Reset switch to RESET at least 2.5 minutes after Load Block 9 is completed
- b. The operator resets the program by placing both Reactor Trip Breaker A-SA and Reactor Trip Breaker B-SB to the closed position momentarily after all actuation signals have been cleared
- c. The program automatically resets when Auxiliary Bus D To Emergency Bus A-SA Breaker 104 and Emergency Bus A-SA To Aux Bus D Tie Breaker 105 SA are closed during the restoration of offsite power
- d. The program automatically resets when Diesel Generator A-SA Breaker 106 SA is opened during the restoration of offsite power

ANSWER:

- c. The program automatically resets when Auxiliary Bus D To Emergency Bus A-SA Breaker 104 and Emergency Bus A-SA To Aux Bus D Tie Breaker 105 SA are closed during the restoration of offsite power

QUESTION: 75

Given the following conditions:

- FRP-S.1, "Response to Nuclear Power Generation / ATWS," is being performed.
- The operating crew is about to exit FRP-S.1.

Boration should continue even after exiting FRP-S.1 to ensure ...

- a. adequate shutdown margin is established since the criteria for exiting FRP-S.1 is only that the reactor be subcritical.
- b. the reactor becomes subcritical since the criteria for exiting FRP-S.1 is only that the power range channels indicate $< 5\%$.
- c. cold shutdown boron concentration is achieved since additional boron, beyond that needed to make the reactor subcritical, is required to compensate for the cooldown portion of the recovery.
- d. refueling boron concentration is achieved since additional boron, beyond that needed to make the reactor subcritical, is required to allow for core offloading to inspect for fuel damage.

ANSWER:

- a. adequate shutdown margin is established since the criteria for exiting FRP-S.1 is only that the reactor be subcritical.

QUESTION: 76

Given the following conditions:

- Spent resin is being sluiced from the Cation Demineralizer to a Spent Resin Storage Tank.
- The operator reports that it appears that a pipe in the overhead of a hallway is plugged with resin.
- HP reports the results of a radiation survey as follows:
 - 2500 mr/hr on contact with pipe
 - 1200 mr/hr @ 18 inches from the pipe
 - 5 mr/hr at floor level below the pipe

Which one of the following describes the required radiological postings?

- a. **NO** postings are required because a ladder is required to access the pipe area
- b. Very High Radiation Area with red flashing light
- c. High Radiation Area with a red flashing light
- d. High Radiation Area, but **NO** red flashing light required

ANSWER:

- c. High Radiation Area with a red flashing light

QUESTION: 77

Given the following conditions:

- A makeup to the PRT is in progress per OP-100, "Reactor Coolant System."
- Both RC-161, RMW TO CNMT, and RC-167, RMW TO PRT, are open.

Which of the following signals will automatically terminate the PRT makeup **AND** how will the valves respond?

- a.
 - **ONLY** a Phase A signal
 - RC-161, RMW TO CNMT, closes
 - RC-167, RMW TO PRT, remains open
- b.
 - **ONLY** a Phase A signal
 - RC-161, RMW TO CNMT, remains open
 - RC-167, RMW TO PRT, closes
- c.
 - **EITHER** a Phase A signal **OR** a high PRT level
 - RC-161, RMW TO CNMT, closes
 - RC-167, RMW TO PRT, remains open
- d.
 - **EITHER** a Phase A signal **OR** a high PRT level
 - RC-161, RMW TO CNMT, remains open
 - RC-167, RMW TO PRT, closes

ANSWER:

- a.
 - **ONLY** a Phase A signal
 - RC-161, RMW TO CNMT, closes
 - RC-167, RMW TO PRT, remains open

QUESTION: 78

Given the following conditions:

- An Emergency Boration of the RCS is required to be performed.
- Boric Acid Pump 'B' is operating.

Which of the following will result in the **SLOWEST** boration of the RCS in accordance with AOP-002, "Emergency Boration?"

- a. Open both 1CS-283, Boric Acid To Boric Acid Blender FCV-113A and 1CS-155, Make Up To VCT FCV-114A
- b. Open both 1CS-283, Boric Acid To Boric Acid Blender FCV-113A and 1CS-156, Make Up To CSIP Suction FCV-113B
- c. Open either 1CS-291, Suction From RWST LCV-115B or 1CS-292, Suction From RWST LCV-115D
- d. Open 1CS-278, Emergency Boric Acid Addition

ANSWER:

- a. Open both 1CS-283, Boric Acid To Boric Acid Blender FCV-113A and 1CS-155, Make Up To VCT FCV-114A

QUESTION: 79

The compensating voltage on Intermediate Range (IR) channel N-35 is set too low, resulting in N-35 stabilizing at 2×10^{-10} amps during a reactor shutdown.

When IR channel N-36 drops below 5×10^{-11} amps ...

- a. **BOTH** SR NIs will automatically energize.
- b. **ONLY** SR channel N-31 will automatically energize.
- c. **ONLY** SR channel N-32 will automatically energize.
- d. **NEITHER** SR NI will automatically energize.

ANSWER:

- d. **NEITHER** SR NI will automatically energize.

QUESTION: 80

Which of the following is an acceptable condition in accordance with AOP-010, "Feedwater Malfunctions?"

- a.
 - Power level at 65%
 - No (0) Heater Drain Pumps operating
 - One (1) train of Feed Water Pumps (FWP, CBP, CP) operating
- b.
 - Power level at 98%
 - One (1) Heater Drain Pump operating
 - Two (2) trains of Feed Water Pumps (FWP, CBP, CP) operating
- c.
 - Power level at 92%
 - No (0) Heater Drain Pumps operating
 - Two (2) trains of Feed Water Pumps (FWP, CBP, CP) operating
- d.
 - Power level at 70%
 - One (1) Heater Drain Pump operating
 - One (1) train of Feed Water Pumps (FWP, CBP, CP) operating

ANSWER:

- b.
 - Power level at 98%
 - One (1) Heater Drain Pump operating
 - Two (2) trains of Feed Water Pumps (FWP, CBP, CP) operating

QUESTION: 81

Which of the following describes the automatic operation of 1SA-506, Service Air Header Isolation Valve?

- a. Opens if Instrument Air pressure decreases to < 90 psig
- b. Closes if Service Air pressure decreases to < 90 psig
- c. Opens if Service Air pressure decreases to < 90 psig
- d. Closes if Instrument Air pressure decreases to < 90 psig

ANSWER:

- d. Closes if Instrument Air pressure decreases to < 90 psig

QUESTION: 82

Given the following conditions:

- PATH-2 is being performed in response to a tube rupture on SG 'C'.
- SI termination criteria is being checked.
- If SI termination criteria cannot be met, a transition to another procedure is required.

Over the last several minutes:

- RCS subcooling has gone from 60°F to 63°F.
- Levels in SG 'A' and 'B' have increased from 45% to 50%.
- PRZ level has increased from 43% to 47%.
- RCS temperature has gone from 472°F to 468°F.
- RCS pressure has gone from 885 psig to 880 psig.

The Unit-SCO asks if "RCS pressure is stable or increasing."

Which of the following describes how the operator should respond **AND** what actions should be taken?

- a.
 - RCS pressure is still decreasing.
 - The cooldown must be stabilized to determine if RCS pressure has stabilized.
- b.
 - RCS pressure is still decreasing.
 - SI cannot be terminated and a transition to the appropriate procedure must be made.
- c.
 - RCS pressure is stable.
 - The cooldown must be stabilized in order to verify the trend.
- d.
 - RCS pressure is stable.
 - SI can be terminated.

ANSWER:

- d.
 - RCS pressure is stable.
 - SI can be terminated.

QUESTION: 83

Which of the following are the lower and upper limits on H₂ concentration for placing the Electric Hydrogen Recombiners in service in accordance with OP-125, "Post Accident Hydrogen System?"

- a. 0.5% - 4.0%
- b. .0.5% - 6.0%
- c. 1.0% - 4.0%
- d. 1.0% - 6.0%

ANSWER:

- a. 0.5% - 4.0%

QUESTION: 84

Given the following conditions:

- The plant is operating at 100% power.
- The Condenser Zone 1 low-pressure turbine boot seal ruptures, causing a turbine trip and reactor trip.
- A complete loss of Zone 1 and Zone 2 vacuum occurs.

Which of the following will automatically actuate to stabilize RCS temperature **AND** why are the Condenser Steam Dumps **NOT** used?

- a.
 - Steam Generator PORVs
 - Ensure the condenser does **NOT** reach saturation conditions
- b.
 - Steam Generator PORVs
 - Protect the condenser from an overpressure condition
- c.
 - Atmospheric Steam Dumps
 - Ensure the condenser does **NOT** reach saturation conditions
- d.
 - Atmospheric Steam Dumps
 - Protect the condenser from an overpressure condition

ANSWER:

- b.
 - Steam Generator PORVs
 - Protect the condenser from an overpressure condition

QUESTION: 85

Which of the following sets of conditions would require that AOP-022, "Loss of Service Water," be performed?

- a.
 - ALB-002-1-1, EMER SERV WTR PMPS HDR STR HIGH ΔP OR LOSS OF PWR, in alarm
 - Local strainer ΔP indicating 20 psid
 - ESW header pressure indicating 51 psig
- b.
 - ALB-002-3-2, SW BSTR PUMP A AUTO START FAIL/OVERRIDE, in alarm
 - ALB-002-3-3, SW BSTR PUMP A O/C TRIP OR CLOSE CKT TROUBLE, in alarm
 - SI actuated
- c.
 - ALB-002-6-2, SERV WTR PUMPS DISCHARGE VLV NOT FULL OPEN, in alarm
 - NSW Pump 'A' has been started in Priming Mode
 - NSW Pump discharge valve 10% open
- d.
 - ALB-002-7-5, COMPUTER ALARM SERVICE WATER, in alarm
 - Main Reservoir temperature indicating 94°F
 - Aux Reservoir temperature indicating 88°F

ANSWER:

- a.
 - ALB-002-1-1, EMER SERV WTR PMPS HDR STR HIGH ΔP OR LOSS OF PWR, in alarm
 - Local strainer ΔP indicating 20 psid
 - ESW header pressure indicating 51 psig

QUESTION: 86

Given the attached form from OST-1093 (next page) and the following conditions:

- Maintenance has been performed on 1CS-752 SB, Charging/SI Pump B-SB Alternate Miniflow.
- A full flow test of the valve has been performed in accordance with OST-1093, "CVCS/SI System Operability Train B."
- Stroke time in open direction was 5.06 seconds.
- Stroke time in closed direction was 8.02 seconds.

Which of the following conditions apply to the results of the test?

- a.
 - Declare the valve operable
 - No additional paperwork is required
- b.
 - Retest the valve if no mechanical failures are known to exist
 - If the valve is within limits on retest, declare the valve operable
 - No additional paperwork is required
- c.
 - Retest the valve if no mechanical failures are known to exist
 - If the valve is within limits on retest, declare the valve operable
 - Initiate a Condition Report identifying the test results
- d.
 - Declare the valve inoperable
 - Initiate a Condition Report identifying the test results

ANSWER:

- c.
 - Retest the valve if no mechanical failures are known to exist
 - If the valve is within limits on retest, declare the valve operable
 - Initiate a Condition Report identifying the test results

QUESTION: 87

Given the following conditions:

- The plant is operating at 90% power.
- Control Bank 'C' Rod D-4, located at the edge of the core near PR NI N-43, has slipped to approximately 6 steps off the bottom of the core and appears to be stuck.

Which of the following parameters would be the **LEAST LIKELY** to aid in detecting the rod misalignment?

- a. Quadrant Power Tilt Ratio calculations
- b. Power Range Nuclear Instrument indications
- c. Axial Flux Difference indications
- d. Core Exit Thermocouple temperature indications

ANSWER:

- c. Axial Flux Difference indications

QUESTION: 88

Given the following conditions:

- The unit is in a Refueling Outage.
- A spent fuel assembly is attached to the manipulator crane.
- A failure of the Reactor Vessel permanent cavity seal ring causes cavity level to drop approximately 3" every minute.
- The Refueling Crew is in the process of placing the assembly in the Reactor Vessel when a Loss of Off-Site Power occurs.

Upon the loss of off-site power there is **NO** means for ...

- a. making up to the cavity.
- b. monitoring radiological levels inside Containment.
- c. monitoring the reactivity condition of the core.
- d. placing the fuel assembly in the vessel.

ANSWER:

- d. placing the fuel assembly in the vessel.

QUESTION: 89

FRP-J.1, "Response to High Containment Pressure," monitors the status of the ESW Booster Pumps.

Which of the following is the concern if ESW Booster pumps are **NOT** running while high containment pressure conditions exist?

- a. ESW Pump runout
- b. Flooding of safety equipment in containment
- c. Reduced containment cooling capability
- d. Radioactivity release to the environment

ANSWER:

- d. Radioactivity release to the environment

QUESTION: 90

Given the following conditions:

- A plant cooldown is in progress.
- All three (3) RCPs are operating.
- ALB-010-8-5A, "CMPTR ALARM RX COOLANT," is in alarm and investigation reveals RCP 'C' Radial Bearing Temp has exceeded the warning alarm setpoint and is approaching the alarm limit of 220°F.
- Seal injection to each RCP is approximately 10 gpm.

Which of the following conditions would direct opening the RCP No. 1 seal bypass valve in accordance with OP-100, "Reactor Coolant System?"

- a.
 - RCS pressure 850 psig
 - RCP 'A' No. 1 seal leakoff 1.2 gpm
 - RCP 'B' No. 1 seal leakoff 0.9 gpm
 - RCP 'C' No. 1 seal leakoff 1.3 gpm
- b.
 - RCS pressure 1060 psig
 - RCP 'A' No. 1 seal leakoff 0.7 gpm
 - RCP 'B' No. 1 seal leakoff 0.9 gpm
 - RCP 'C' No. 1 seal leakoff 0.8 gpm
- c.
 - RCS pressure 640 psig
 - RCP 'A' No. 1 seal leakoff 1.2 gpm
 - RCP 'B' No. 1 seal leakoff 1.1 gpm
 - RCP 'C' No. 1 seal leakoff 1.1 gpm
- d.
 - RCS pressure 1110 psig
 - RCP 'A' No. 1 seal leakoff 1.2 gpm
 - RCP 'B' No. 1 seal leakoff 0.8 gpm
 - RCP 'C' No. 1 seal leakoff 0.9 gpm

ANSWER:

- a.
 - RCS pressure 850 psig
 - RCP 'A' No. 1 seal leakoff 1.2 gpm
 - RCP 'B' No. 1 seal leakoff 0.9 gpm
 - RCP 'C' No. 1 seal leakoff 1.3 gpm

QUESTION: 91

A valve lineup calls for a valve to be OPEN and by the difference of grease on the stem and the stem length exposure the valve appears open.

The operator verifying this valve open should ...

- a. sign the valve off as open.
- b. try to open the valve to ensure it is full open.
- c. move the valve closed and then reopen the valve.
- d. observe down stream system flow or pressure to ensure open.

ANSWER:

- c. move the valve closed and then reopen the valve.

QUESTION: 92

Which of the following is the basis for the Technical Specification limit of 31 gpm on Controlled Leakage?

- a. Sufficiently low to ensure early detection of additional leakage
- b. Allows limited known leakage with the ability to detect additional leakage
- c. Ensures safety injection flow is greater than that analyzed for a LOCA
- d. Keeps dose to a small fraction of limits in the event of a SGTR or steam line break

ANSWER:

- c. Ensures safety injection flow is greater than that analyzed for a LOCA

QUESTION: 93

The unit is operating at 100% power.

If 125 VDC Bus 1A-SA deenergizes due to a fault on the bus ...

- a. the reactor will trip due to an undervoltage (UV) trip of Train SA reactor trip breaker.
- b. the reactor will trip due to a shunt trip of Train SA reactor trip breaker.
- c. an undervoltage trip signal will **NOT** be capable of opening Train SA reactor trip breaker.
- d. a shunt trip signal will **NOT** be capable of opening Train SA reactor trip breaker.

ANSWER:

- d. a shunt trip signal will **NOT** be capable of opening Train SA reactor trip breaker.

QUESTION: 94

A waste gas release is in progress when the WPB Stack 5 PIG radiation monitor, REM-1WV-3546, exceeds the high alarm setpoint.

Which of the following describes how the release will be automatically terminated?

- a. Waste Gas Decay Tanks E & F to Plant Vent, 3WG-229, CLOSES
- b. Running Waste Gas Compressor TRIPS
- c. Filtered Exhaust Fans, E-46, E-47, E-48, and E-49 TRIP
- d. Gas Decay Tanks to Plant Vent Isolation Valve, 3WG-230, CLOSES

ANSWER:

- a. Waste Gas Decay Tanks E & F to Plant Vent, 3WG-229, CLOSES

QUESTION: 95

Given the following conditions:

- The plant is at 22% power during a shutdown.
- Source Range Channel N-31 has been declared inoperable as a result of failing to meet Operational Test Criteria of MST-I0169.
- The test was performed, per GP-006, during a Tech Spec 3.0.3 required shutdown (i.e., the shutdown must continue).
- OWP-RP-19 has been performed, which places the LEVEL TRIP BYPASS switch in the BYPASS position and verifies the associated light on the Bypass Permissive Light Panel.
- The I&C Supervisor states that both control and instrument power must be removed from the drawer to replace a bistable module.

Assuming the instrument and control power are removed for the remainder of the shutdown, the shutdown continues and ...

- a. the reactor trips when the fuses are removed.
- b. the reactor trips when power is reduced below P-10.
- c. the reactor trips when power is reduced below P-6.
- d. NO reactor trip occurs.

ANSWER:

- c. the reactor trips when power is reduced below P-6.

QUESTION: 96

Which of the following describes the operation of 1CS-50, Letdown to VCT/Demin?

- a. Automatically bypasses the CVCS Demineralizers when TE-143, LP Letdown Temperature, exceeds 135°F to prevent an inadvertent dilution event
- b. Automatically bypasses the CVCS Demineralizers when TE-143, LP Letdown Temperature, exceeds 135°F to prevent damage to the demineralizer resin
- c. Automatically bypasses the CVCS Demineralizers when TE-144, Letdown HX Outlet Temperature, exceeds 135°F to prevent an inadvertent dilution event
- d. Automatically bypasses the CVCS Demineralizers when TE-144, Letdown HX Outlet Temperature, exceeds 135°F to prevent damage to the demineralizer resin

ANSWER:

- b. Automatically bypasses the CVCS Demineralizers when TE-143, LP Letdown Temperature, exceeds 135°F to prevent damage to the demineralizer resin

QUESTION: 97

Given the following conditions:

- During Mode 3 operations, a large break LOCA occurred concurrently with a loss of offsite power.
- Both EDGs started and loaded.
- The BOP operator secured all running AFW pumps with SG levels all at 55%.
- SI has **NOT** been reset and offsite power has **NOT** been restored.

If SG narrow range levels decrease to the following levels,

<u>SG</u>	<u>LEVEL</u>
A	22%
B	17%
C	27%

which of the following describes the expected AFW pump operation?

- MDAFW Pump 1A-SA running
 - MDAFW Pump 1B-SB running
 - TDAFW Pump running
- MDAFW Pump 1A-SA running
 - MDAFW Pump 1B-SB running
 - TDAFW Pump secured
- MDAFW Pump 1A-SA secured
 - MDAFW Pump 1B-SB secured
 - TDAFW Pump running
- MDAFW Pump 1A-SA secured
 - MDAFW Pump 1B-SB secured
 - TDAFW Pump secured

ANSWER:

- MDAFW Pump 1A-SA secured
 - MDAFW Pump 1B-SB secured
 - TDAFW Pump running

QUESTION: 98

Given the following conditions:

- A small break LOCA occurred and SI has been terminated in accordance with EPP-008, "SI Termination."
- SI Reinitiation criteria has been met.

Which of the following should be isolated **PRIOR TO** re-opening the BIT valves to prevent CSIP runout conditions?

- a. Charging
- b. Seal injection
- c. Normal miniflow
- d. Alternate miniflow

ANSWER:

- a. Charging

QUESTION: 99

Which of the following Emergency Operating Procedure actions may the operating crew perform before being directed to perform the step in the appropriate EOP in accordance with the EOP User's Guide?

- a. Isolating AFW to a ruptured SG and closing the Main Steam Isolation Valve from the ruptured SG immediately upon completion of the Immediate Actions of PATH-1
- b. Throttling AFW to supply all three (3) SGs at 100 KPPH per SG with one AFW pump during the performance of EPP-FRP-S.1, "Response to Nuclear Power Generation - ATWS," with all SG narrow range levels below 5%
- c. Restoring AFW to a faulted SG after it has been isolated to establish the maximum cooldown rate available during the performance of PATH-2
- d. Throttling AFW flow to all three (3) SGs at 50 KPPH per SG to maintain intact SG levels between 25% and 50% immediately upon completion of the Immediate Actions of PATH-1

ANSWER:

- d. Throttling AFW flow to all three (3) SGs at 50 KPPH per SG to maintain intact SG levels between 25% and 50% immediately upon completion of the Immediate Actions of PATH-1

QUESTION: 100

Given the following conditions:

- Following a large break LOCA, SI has been reset.
- The crew has just completed the performance of EPP-010, "Transfer to Cold Leg Recirculation," and have transitioned back to PATH-1.
- A loss of offsite power occurs following the transition to PATH-1.

Core cooling will be ...

- a. automatically re-established immediately when the Emergency Diesel Generator output breaker closes.
- b. automatically re-established within minutes after the Emergency Diesel Generator output breaker closes.
- c. lost until the operator re-opens the RHR suction valves after the Emergency Diesel Generator output breaker closes.
- d. lost until the operator restarts the RHR pumps after the Emergency Diesel Generator output breaker closes.

ANSWER:

- d. lost until the operator restarts the RHR pumps after the Emergency Diesel Generator output breaker closes.

QUESTION: 76

Given the following conditions:

- Both RHR pumps are inoperable.
- At 0700 today, during repair efforts, a Maintenance person exited the area after receiving a Total Effective Dose Equivalent of 5800 mRem.
- At 0730 today, a plant shutdown was commenced due to both RHR pumps being inoperable.

When are the notifications to the NRC required to be completed by for these events?

- a.
 - 0745 today for the plant shutdown
 - 0800 today for the over-exposure
- b.
 - 0745 today for the plant shutdown
 - 0700 tomorrow for the over-exposure
- c.
 - 1130 today for the plant shutdown
 - 0800 today for the over-exposure
- d.
 - 1130 today for the plant shutdown
 - 0700 tomorrow for the over-exposure

ANSWER:

- d.
 - 1130 today for the plant shutdown
 - 0700 tomorrow for the over-exposure

QUESTION: 77

Given the following conditions:

- The plant is operating at 60% power.
- RCS Tavg is on program.
- PRZ level is on program.
- The Median Tavg input to PRZ level fails high.
- The operator places LK-459, PRZ Master Level Controller, in MANUAL.

In order to control PRZ level at program level, the operator should be directed to control PRZ level at ...

- a. 36%.
- b. 41%.
- c. 46%.
- d. 51%.

ANSWER:

- c. 46%.

QUESTION: 78

Given the following conditions:

- A LOCA occurred several hours ago, resulting in a start of both Containment Spray Pumps.
- Only one (1) Containment Spray Pump is currently running due to actions taken in EPP-012, "Loss of Emergency Coolant Recirculation."
- A transition has just been made to FRP-J.1, "Response to High Containment Pressure."
- Containment Pressure is 14 psig.

Which of the following actions should be taken?

- a. Restart the second Containment Spray Pump if Containment pressure does **NOT** decrease below 10 psig before exiting FRP-J.1.
- b. Restart the second Containment Spray Pump since pressure is above 10 psig.
- c. Continue operation with one Containment Spray Pump.
- d. Continue operation with one Containment Spray Pump unless Containment pressure begins increasing, then start the second pump.

ANSWER:

- c. Continue operation with one Containment Spray Pump.

QUESTION: 79

In addition to Radiation Levels inside containment, which of the following parameters are checked when determining whether an entry is required to be made into EPP-FRP-J.3, "Response to Containment High Radiation Level?"

- a. Containment Pressure, Containment Sump Levels, and Containment Spray Pump status
- b. **ONLY** Containment Pressure and Containment Sump Levels
- c. **ONLY** Containment Pressure and Containment Spray Pump status
- d. **ONLY** Containment Sump Levels and Containment Spray Pump status

ANSWER:

- b. **ONLY** Containment Pressure and Containment Sump Levels

QUESTION: 80

Given the following conditions:

- Just prior to shift change, the oncoming Reactor Operator calls in sick.
- The shift schedule shows the oncoming crew at minimum complement with the Reactor Operator, but there is a Licensed Operator (CO) scheduled for the RAB.

The S-SO should ...

- a. use the RAB CO in the control room and replace the RAB whenever possible.
- b. use the RAB CO in the control room and call in a replacement RAB within two hours.
- c. hold the off-going CO until he can ensure a replacement will arrive within two hours.
- d. hold the off-going CO until a replacement can relieve him.

ANSWER:

- d. hold the off-going CO until a replacement can relieve him.

QUESTION: 81

Given the following conditions:

- During refueling operations, **NO** spent fuel assembly is attached to the manipulator crane gripper.
- Refueling personnel discover that they are unable to move the bridge or trolley.

Which of the following is the most likely cause of the inability to move the bridge or trolley?

- a. The gripper is **NOT** in the FULL UP position inside the mast
- b. The gripper is **NOT** at least 12 inches up inside the mast
- c. The gripper is failed in the ENGAGED position
- d. A slack cable condition is sensed by the gripper

ANSWER:

- b. The gripper is **NOT** at least 12 inches up inside the mast

QUESTION: 82

Which one of the following describes the bases for the off-site power distribution Technical Specification that requires two (2) independent off-site power sources?

- a. The requirement can only be satisfied by the off-site transmission lines that feed the SUTs directly (Cary Regency Park and Cape Fear North)
- b. The requirement can only be satisfied by the off-site transmission lines that do not feed the respective north or south switchyard bus through a jumper
- c. The requirement is satisfied as long as the switchyard alignment is such that power is available from the off-site transmission network to both SUTs regardless of the number of transmission lines available
- d. The requirement is satisfied as long as there are two separate off-site transmission lines that can power the SUTs (either through the switchyard or directly)

ANSWER:

- d. The requirement is satisfied as long as there are two separate off-site transmission lines that can power the SUTs (either through the switchyard or directly)

QUESTION: 83

Given the following conditions:

- During a refueling outage, the SRO-Fuel Handling reports that the crew is having difficulties loading several fuel assemblies in the vicinity of the hot legs due to the flow through the piping.
- He has requested that the RHR system be secured to allow loading the assemblies.

Which of the following identifies how long the RHR system may be secured under these conditions?

- a. 1 hour per 2-hour period
- b. 1 hour per 4-hour period
- c. Up to 2 hours
- d. Up to 4 hours

ANSWER:

- a. 1 hour per 2-hour period

QUESTION: 84

An action that deviates from the Facility Operating License requirements for fire protection is deemed necessary to protect the public health and safety.

Which of the following is required, according to PRO-NGGC-0200, "Procedure Use and Adherence?"

- a. The deviation shall be approved by the Manager - Operations prior to performing the protective action
- b. The deviation shall be approved by the Superintendent – Shift Operations prior to performing the protective action
- c. The state and counties must be notified as soon as possible after performing the protective action and within 60 minutes in all cases
- d. The NRC must be notified prior to performing the protective action

ANSWER:

- b. The deviation shall be approved by the Superintendent – Shift Operations prior to performing the protective action

QUESTION: 85

Given the following conditions:

- Following a reactor trip and safety injection concurrent with a loss of offsite power, a transition has been made to EPP-015, "Uncontrolled Depressurization Of All Steam Generators."
- Emergency Diesel Generator 1B-SB has tripped and cannot be restarted.
- The TD AFW pump has tripped on overspeed and cannot be reset.
- MDAFW pump 1A-SA is tagged out.
- SG 'A' narrow level is 6%.
- SG 'B' and 'C' narrow range levels are off-scale low.
- Core exit thermocouple temperatures are all between 705°F and 720°F.

Which of the following actions should be taken?

- a. Continue in EPP-015, "Uncontrolled Depressurization Of All Steam Generators"
- b. Transition to EPP-001, "Loss of AC Power to 1A-SA and 1B-SB Buses"
- c. Transition to EPP-FRP-C.1, "Response to Inadequate Core Cooling"
- d. Transition to EPP-FRP-H.1, "Response to Loss of Secondary Heat Sink"

ANSWER:

- d. Transition to EPP-FRP-H.1, "Response to Loss of Secondary Heat Sink"

QUESTION: 86

Given the following conditions:

- The unit is in Mode 5 with the RCS filled.
- RHR Train 'A' is in operation.
- RHR Train 'B' is operable, but not in operation.
- SG wide range levels are:

<u>SG</u>	<u>LEVEL</u>
A	81%
B	68%
C	63%

- Maintenance requests that RHR Pump 'B' be removed from operable status for several hours for minor maintenance.

Which of the following describes the acceptability of removing RHR Pump 'B' from service under these conditions?

- a. It may **NOT** be done because the SGs are not an adequate heat sink under these conditions.
- b. It may **NOT** be done because two RHR trains are required at all times for Mode 5.
- c. It may be done as long as the RCS remains filled.
- d. It may be done as long as RCS temperature remains below 200°F.

ANSWER:

- a. It may **NOT** be done because the SGs are not an adequate heat sink under these conditions.

QUESTION: 87

Given the following conditions:

- Safety injection is being terminated in accordance with EPP-008, "SI Termination."
- The operator reports 1SI-3, BIT Outlet, is closed as directed, but 1SI-4, BIT Outlet, will **NOT** close.
- An operator unsuccessfully attempts to locally close 1SI-4.

Which of the following actions should be taken?

- a.
 - Unlock and close 1SI-2, BIT Inlet, **ONLY**
 - Establish normal charging flow while waiting for 1SI-2 to be closed
- b.
 - Unlock and close 1SI-2, BIT Inlet, **ONLY**
 - Wait until 1SI-2 is closed before establishing normal charging flow
- c.
 - Unlock and close **BOTH** 1SI-1, BIT Inlet, and 1SI-2, BIT Inlet
 - Establish normal charging flow while waiting for 1SI-1 and 1SI-2 to be closed
- d.
 - Unlock and close **BOTH** 1SI-1, BIT Inlet, and 1SI-2, BIT Inlet
 - Wait until 1SI-1 and 1SI-2 are closed before establishing normal charging flow

ANSWER:

- d.
 - Unlock and close **BOTH** 1SI-1, BIT Inlet, and 1SI-2, BIT Inlet
 - Wait until 1SI-1 and 1SI-2 are closed before establishing normal charging flow

QUESTION: 88

Given the following conditions:

- At 0530, RCS temperature was being maintained at 550°F.
- A small break LOCA occurred.
- At 0545, the crew is ready to commence a cooldown to cold shutdown in accordance with EPP-009, "Post LOCA Cooldown and Depressurization."
- RCS temperature at 0545 is 490°F.

Which of the following identifies the lowest allowable temperature of the RCS at 0630 if the crew begins the **MAXIMUM** permissible cooldown rate **AND** the basis for this temperature limit?

- a. 450°F to ensure that a transition is **NOT** required to be made to FRP-P.1, "Response to Imminent Pressurized Thermal Shock"
- b. 450°F to ensure that Technical Specification cooldown limits are **NOT** exceeded
- c. 415°F to ensure that a transition is **NOT** required to be made to FRP-P.1, "Response to Imminent Pressurized Thermal Shock"
- d. 415°F to ensure that Technical Specification cooldown limits are **NOT** exceeded

ANSWER:

- b. 450°F to ensure that Technical Specification cooldown limits are **NOT** exceeded

QUESTION: 89

Given the following conditions:

- Following a loss of offsite power, EPP-001, "Loss of AC Power to 1A-SA and 1B-SB Buses," is being performed.
- Safety Injection has been actuated and reset.
- Attachment 5, "6.9 KV Emergency Bus Breakers," has been completed and all breakers have been verified open.
- The SGs are being depressurized.
- Several minutes later, Emergency Diesel Generator 1A-SA is started.
- SG pressures are stabilized.
- ESW Pump 1A-SA is started and the valve alignment for Header 'A' has been verified.

Plant conditions are now:

- EDG 1A-SA is running.
- ESW Pump 1A-SA is running.
- NO other pumps are running.
- NO SI valves have repositioned from their "at power" position.
- RCS pressure is 1400 psig.
- RCS temperature is 492°F.
- RCS subcooling is 96°F.
- PRZ level is 6%.

Which of the following identifies the procedure(s) to be used for recovery from this condition?

- a. EPP-002, "Loss Of All AC Power Recovery Without SI Required"
- b. EPP-003, "Loss Of All AC Power Recovery With SI Required"
- c. EOP-PATH-1 and AOP-025, "Loss of One Emergency AC Bus or One Emergency DC Bus," performed concurrently
- d. EOP-PATH-1 and FRP-I.2, "Response to Low Pressurizer Level," performed concurrently

ANSWER:

- b. EPP-003, "Loss Of All AC Power Recovery With SI Required"

QUESTION: 90

Conditions meeting the Emergency Classification criteria for a Notification of Unusual Event have been determined to have existed, but no longer exist.

As the Site Emergency Coordinator you should ...

- a. declare and terminate the event in a single notification message.
- b. declare the event in a notification message and terminate the event in a followup message.
- c. notify the NRC of the conditions, but **NO** notifications to the state and county would be performed.
- d. notify Licensing of the need to generate an LER, but no other notifications would be performed.

ANSWER:

- a. declare and terminate the event in a single notification message.

QUESTION: 91

A reactor startup is being performed following a mid-cycle outage per GP-004, "Reactor Startup (Mode 3 to Mode 2)."

Estimated Critical Conditions are as follows:

TIME	1830
BORON CONC.	1215 ppm
CONT BANK 'C' POSTION	218 steps
CONT BANK 'D' POSTION	90 steps
ECC - 500 PCM POSITION	45 steps on Bank 'D'
ECC + 500 PCM POSITION	197 steps on Bank 'D'
ROD INSERTION LIMIT	0 steps on Bank 'D'

The Actual Critical Conditions are as follows:

TIME	1836
BORON CONC.	1198 ppm
CONT BANK 'C' POSTION	110 steps
CONT BANK 'D' POSTION	0 steps

Which of the following actions must be taken?

- Shut down the reactor using OP-104, "Rod Control System," **AND** borate, as needed, to increase RCS boron concentration to 1215 ppm
- Maintain critical conditions **AND** borate, as needed, to increase RCS boron concentration to 1215 ppm
- Shut down the reactor using OP-104, "Rod Control System," **AND** initiate Emergency Boration per AOP-002, "Emergency Boration"
- Trip the reactor **AND** initiate Emergency Boration per AOP-002, "Emergency Boration"

ANSWER:

- Shut down the reactor using OP-104, "Rod Control System," **AND** initiate Emergency Boration per AOP-002, "Emergency Boration"

QUESTION: 92

Given the following conditions:

- A small break LOCA has occurred.
- Entry has been made into FRP-C.1, "Response to Inadequate Core Cooling."
- Core exit thermocouples are all indicating between 740 °F and 760 °F and rising slowly.
- RCS pressure has stabilized at 805 psig.
- PZR level is off-scale low.
- RVLIS Full Range is indicating 32% and lowering slowly.
- NO CSIPs are available.
- SG narrow range levels are all off-scale low.
- Total AFW flow to the SGs is 240 KPPH.

Which of the following actions should be taken?

- a. Dump steam to cooldown and depressurize the RCS to cause the SI accumulators to dump
- b. Open the RCS Head Vent valves to depressurize the RCS to cause the SI accumulators to dump
- c. Start an RCP immediately to provide forced cooling flow
- d. Open the PRZ PORVs to depressurize the RCS to cause the SI accumulators to dump

ANSWER:

- a. Dump steam to cooldown and depressurize the RCS to cause the SI accumulators to dump

QUESTION: 93

Given the following conditions:

- A large break LOCA has occurred.
- EPP-012, "Loss of Emergency Coolant Recirculation," is being performed.
- One (1) CSIP is operating with a flow rate of 520 gpm.
- One (1) RHR pump is operating with a flow rate of 3350 gpm.
- Time after trip and SI is 73 minutes.
- SI **CANNOT** be terminated due to insufficient subcooling.

Which of the following actions should be taken to establish SI flow greater than the minimum required for decay heat removal?

- a. Stop the CSIP
- b. Start the standby CSIP
- c. Manually throttle high head SI flow
- d. Stop the RHR pump

ANSWER:

- d. Stop the RHR pump

QUESTION: 94

Given the following conditions:

- A reactor startup is in progress.
- Power level is stable at 10^{-8} amps.
- Electrical Maintenance reports there is a potential problem with the inverter for Instrument Bus IDP-1A-SI and recommends placing the bus on the alternate power supply (PP-1A211-SA).

Which of the following describes the effect of permitting this re-alignment?

- a. **NO** reactor trip occurs, but the reactor startup is delayed due to C-1, Intermediate Range Rod Stop
- b. **NO** reactor trip occurs, but the reactor startup is delayed due to C-2, Power Range Overpower Rod Stop
- c. Reactor trip on Intermediate Range High Flux
- d. Reactor trip on Power Range High Flux Low Setpoint

ANSWER:

- c. Reactor trip on Intermediate Range High Flux

QUESTION: 95

Given the following conditions:

- A reactor trip and safety injection occurred.
- During the performance of PATH-1, an ORANGE path was noted on the Core Cooling status tree and a transition was made to the appropriate procedure.

Which of the following describes how the CSF status trees should be monitored at this point?

- a. Suspend monitoring until actions have been completed for the ORANGE path condition
- b. Monitor for information only until actions have been completed for the ORANGE path condition
- c. Monitor every 10 to 20 minutes
- d. Monitor continuously

ANSWER:

- d. Monitor continuously

QUESTION: 96

Given the following conditions:

- The plant is operating at 50% power
- Train 'A' safety equipment is in service
- ALB 24-1-2, 6.9kV EMER BUS A-SA TROUBLE, in alarm
- ALB 25-1-2, 6.9kV EMER BUS B-SB TROUBLE, in alarm
- AEP-2-8, DEGRADED VOLTAGE, in alarm
- AEP-2-9, DEGRADED VOLTAGE, in alarm
- Emergency 6.9 kV Buses 1A-SA and 1B-SB both indicating approximately 6500 volts
- Emergency 480V Buses all indicating approximately 450 volts

Which of the following Emergency Buses will be first to be supplied by its EDG AND which procedure will be used to direct this action?

- a.
 - Emergency Bus A-SA
 - AOP-028, "Grid Instability"
- b.
 - Emergency Bus A-SA
 - OP-155, ""Diesel Generator Emergency Power System"
- c.
 - Emergency Bus B-SB
 - AOP-028, "Grid Instability"
- d.
 - Emergency Bus B-SB
 - OP-155, ""Diesel Generator Emergency Power System"

ANSWER:

- c.
 - Emergency Bus B-SB
 - AOP-028, "Grid Instability"

QUESTION: 97

Given the following conditions:

- A LOCA outside containment has resulted in unsafe radiological conditions in the RAB.
- The crew has taken all the actions of EPP-013, "LOCA Outside Containment," to isolate the break.

Which of the following is the PRIMARY indication used in EPP-013 that the actions taken have been successful AND which procedure should be transitioned to when the isolation is successful?

- a.
 - RAB sump level alarms clearing
 - Transition to PATH-1
- b.
 - RCS pressure increasing
 - Transition to PATH-1
- c.
 - RAB sump level alarms clearing
 - Transition to EPP-008, "SI Termination"
- d.
 - RCS pressure increasing
 - Transition to EPP-008, "SI Termination"

ANSWER:

- b.
 - RCS pressure increasing
 - Transition to PATH-1

QUESTION: 98

Given the following conditions:

- A reactor trip occurred from 23% power.
- Shutdown Bank 'B' Rod L-5 is indicating 228 steps.
- Control Bank 'C' Rod K-8 is indicating 6 steps.
- All other rods have the Rod Bottom Lights lit.
- RCS boron concentration at the time of the trip was 845 ppm.
- The plant is to be maintained at no-load Tavg.

Which of the following actions should be taken **AND** what is the **MINIMUM** RCS boron concentration that must be achieved?

- a. Emergency Borate to raise RCS boron concentration to 1307 ppm
- b. Emergency Borate to raise RCS boron concentration to 2282 ppm
- c. Normal Borate to raise RCS boron concentration to 1307 ppm
- d. Normal Borate to raise RCS boron concentration to 2282 ppm

ANSWER:

- a. Emergency Borate to raise RCS boron concentration to 1307 ppm

QUESTION: 99

Given the following conditions:

- The plant is operating at 40% power.
- A fire alarm has been received.

Which of the following conditions would require that a plant shutdown be required at the earliest time?

- a.
 - RHR Pump 1A-SA has been out-of-service for 18 hours for maintenance
 - The fire requires de-energizing Emergency Bus 1A-SA
- b.
 - RHR Pump 1A-SA has been out-of-service for 18 hours for maintenance
 - The fire is contained in the CSIP 1A-SA pump room
- c.
 - Containment Spray Pump 1B-SB has been out-of-service for 18 hours for maintenance
 - The fire requires de-energizing Aux Bux B
- d.
 - Containment Spray Pump 1B-SB has been out-of-service for 18 hours for maintenance
 - The fire is contained in the CSIP 1A-SA pump room

ANSWER:

- c.
 - Containment Spray Pump 1A-SA has been out-of-service for 18 hours for maintenance
 - The fire requires de-energizing Aux Bux B

QUESTION: 100

Given the following plant conditions:

- A small break LOCA has occurred.
- A transition has been made to EPP-009, "Post LOCA Cooldown and Depressurization."
- Containment pressure is 6.1 psig.
- RCS subcooling is 55°F by ERFIS.
- PRZ level is 31%.
- Both CSIPs are injecting through the BIT.
- Both RHR pumps are secured.
- The operators are depressurizing the RCS to refill the pressurizer to > 40% when subcooling is noted to decrease to 35°F.

Which of the following actions should be taken?

- a. Continue the depressurization in EPP-009
- b. Stop the depressurization and continue in EPP-009
- c. Stop the depressurization and transition to PATH-1
- d. Reinitiate SI and transition to PATH-1

ANSWER:

- a. Continue the depressurization in EPP-009

Draft Submittal

(Pink Paper)

1. Written Exam Sample outlines

**SHEARON HARRIS
EXAM 2002-301**

**50-400
AUGUST 26 - 29, 2002**

Facility: HARRIS		Date of Exam: 8/26/2002						Exam Level: SRO					
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1 Emergency & Abnormal Plant Evolutions	1	2	1	3				4	9			5	24
	2	1	2	1				2	6			4	16
	3	0	0	0				0	2			1	3
	Tier Totals	3	3	4				6	17			10	43
2 Plant Systems	1	1	2	2	2	2	2	1	2	1	1	3	19
	2	2	0	2	2	1	1	2	1	1	3	2	17
	3	1	1	0	1	0	0	1	0	0	0	0	4
	Tier Totals	4	3	4	5	3	3	4	3	2	4	5	40
3 Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					5		4		3		5		
<p>Notes:</p> <p>1 Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2 The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final exam must total 100 points.</p> <p>3 Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4 Systems/evolutions within each group are identified on the associated outline.</p> <p>5 The shaded areas are not applicable to the category/tier.</p> <p>6* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p>7 On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p> <p>8 Shaded topics on individual Tier / Group pages indicate topic is SRO ONLY.</p>													

*Initial
Submitted*

PWR SRO Examination Outline								Form ES-401-3	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1	X						AK1.16 - Definition / application of power defect	3.4	1
000003 Dropped Control Rod / 1						X	2.4.6 - Knowledge of symptom based EOP strategy	4.0	1
000005 Inoperable/Stuck Control Rod / 1					X		AA2.03 - Actions if more than one rod is stuck / inoperable	4.4	1
000011 Large Break LOCA / 3 (PSA)				X			EA1.01 - Control of RCS pressure and temp to avoid violating PTS limits during a LBLOCA	3.8	1
W/E04 LOCA Outside Containment / 3					X		EA2.01 - Selection of procedures during response to LOCA outside containment	4.3	1
W/E01 & E02 Rediagnosis & SI Termination / 3					X		EA2.02 - Adherence to procedures and operations within limits in license during SI Termination	4.0	1
000015/17 RCP Malfunctions / 4				X			AA1.08 - Operate / monitor SG LCS during loss of RCS flow	2.9	1
W/E09&E10 Natural Circ. / 4	X						EK1.02 - Normal, abnormal, and emergency procedures associated with NC operations	3.7	1
000024 Emergency Boration / 1						X	2.1.20 - Ability to execute procedure steps	4.2	1
000026 Loss of Component Cooling Water / 8			X				AK3.01 - Conditions that will initiate automatic operation of SWS valves to CCW coolers	3.5	1
000029 Anticipated Transient w/o Scram / 1			X				EK3.11 - Reasons for initiating Emergency Boration	4.3	1
000040 (W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				X			000040AA1.22 - Operate / monitor load sequencer status lights during a steam line rupture	3.0	1
W/E08 RCS Overcooling - PTS / 4		X					EK2.02 - Heat removal systems, and relationship between proper operation of systems during PTS event	4.0	1
000051 Loss of Condenser Vacuum / 4					X		AA2.02 - Loss of vacuum requiring reactor / turbine trip	4.1	1
000055 Station Blackout / 6						X	2.4.18 - Knowledge of specific bases for EOPs	3.6	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					X		AA2.15 - Determine / interpret that a loss of AC has occurred	4.1	1
000059 Accidental Liquid RadWaste Rel. / 9					X		AA2.03 - Failure modes, symptoms, and causes of misleading indications on liquid rad monitor	3.6	1
000062 Loss of Nuclear Service Water / 4					X		AA2.06 - Length of time after loss of SWS flow to component until damage to component occurs	3.1	1
000067 Plant Fire On-site / 9					X		AA2.13 - Fire conditions requiring emergency plant shutdown	4.4	1
000068 Control Room Evac. / 8			X				AK3.09 - Transfer to local control - charging pumps, flow control, PZR heaters, and boric acid transfer pumps	4.4	1
000069 (W/E14) Loss of CTMT Integrity / 5						X	2.3.10 - Perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
000074 (W/E06&E07) Inad. Core Cooling / 4 (PSA)				X			000074 EA1.05 - Operate / monitor PZR PORV during ICC	4.1	2
					X		W/E06EA2.01 - Selection of procedures during response to Degraded Core Cooling	4.2	
000076 High Reactor Coolant Activity / 9						X	2.4.18 - Knowledge of specific bases for EOPs	3.6	1
K/A Category Totals:	2	1	3	4	9	5	Group Point Total:		24

ES-401		PWR SRO Examination Outline							Form ES-401-3	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points	
000007 Reactor Trip - Stabilization - Recovery / 1	X						EK1.03 - Reasons for isolating the TG after a reactor trip	4.0	1	
000008 Pressurizer Vapor Space Accident / 3					X		AA2.12 - Determine / interpret PZR level indicators	3.7	1	
000009 Small Break LOCA / 3					X		EA2.01 - Action to take during SBLOCA, based on temp and pressure	4.8	1	
W/E03 LOCA Cooldown - Depress. / 4 (PSA)						X	2.4.22 - Bases for prioritizing safety functions in EOPs	4.0	1	
W/E11 Loss of Emergency Coolant Recirc. / 4 (PSA)					X		EA2.02 - Adherence to procedures and operations within limits in license during Loss of Emergency Coolant Recirc	4.2	1	
000022 Loss of Reactor Coolant Makeup / 2						X	2.1.25 - Obtain / interpret station reference materials such as graphs, monographs, and tables.	3.1	1	
000025 Loss of RHR System / 4		X					AK2.05 - Interrelationship between Loss of RHR and reactor building sump	2.6	1	
000027 Pressurizer Pressure Control System Malfunction / 3					X		AA2.15 - Actions if PCS instrument fails high	4.0	1	
000032 Loss of Source Range NI / 7										
000033 Loss of Intermediate Range NI / 7						X	2.4.4 - Recognize abnormal indications for parameters for entry-level conditions for emergency / abnormal procedures.	4.3	1	
000037 Steam Generator Tube Leak / 3				X			AA1.13 - Operate / monitor SGBD rad monitor during tube leak	4.0	1	
000038 Steam Generator Tube Rupture / 3			X				EK3.08 - Criteria for securing RCPs during a SGTR	4.2	1	
000054 Loss of Main Feedwater / 4 (PSA)						X	2.4.16 - EOP implementation hierarchy and coordination with support procedures	4.0	1	
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4		X					EK2.01 - Components, control / safety systems, including auto / manual operation related to Loss of Heat Sink	3.9	1	
000058 Loss of DC Power / 6					X		AA2.03 - Determine / interpret DC loads lost; impact on ability to operate / monitor plant systems	3.9	1	
000060 Accidental Gaseous Radwaste Rel. / 9										
000061 ARM System Alarms / 7										
W/E16 High Containment Radiation / 9					X		EA2.01 - Selection of procedures during response to High Containment Radiation	3.3	1	
000065 Loss of Instrument Air / 8				X			AA1.02 - Operate / monitor components served by IAS to minimize drain on system	2.8	1	
K/A Category Totals:	1	2	1	2	6	4	Group Point Total:		16	

ES-401		PWR SRO Examination Outline							Form ES-401-3	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points	
000028 Pressurizer Level Malfunction / 2					X		AA2.13 - Determine actual PZR level, given uncompensated level and graphs	3.2	1	
000036 Fuel Handling Accident / 8						X	2.2.28 - Knowledge of new and spent fuel movement procedures	3.5	1	
000056 Loss of Off-site Power / 6					X		AA2.22 - Determine / interpret lube oil pump indicators and low pressure alarms on EDG	3.6	1	
W/E13 Steam Generator Over-pressure / 4										
W/E15 Containment Flooding / 5										
					</					

PWR SRO Examination Outline Plant Systems - Tier 2/Group 1													Form ES-401-3	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive				X								K4.11 - Design for resetting CRDM ckt breakers	2.9	2
					X							K5.42 - Definition of Tave and no load Tave	3.0	
003 Reactor Coolant Pump										X		A4.08 - Operate / monitor RCP cooling supplies	2.9	1
004 Chemical and Volume Control			X									K3.08 - Effect of loss of CVCS on RCP seal injection	3.8	2
							X					A1.06 - Monitor changes in VCT level	3.2	
013 Engineered Safety Features Actuation						X						K6.01 - Effect of loss of sensors / detectors on ESFAS	3.1	1
014 Rod Position Indication											X	2.1.11 - Less than one hour tech spec actions	3.8	1
015 Nuclear Instrumentation					X							K5.06 - Implication of subcritical multiplication on NIS	3.7	1
017 In-core Temperature Monitor									X			A3.01 - Incore temp indications of normal, natural, and interrupted circulation of RCS	3.8	1
022 Containment Cooling		X										K2.01 - Power supplies to containment cooling	3.1	2
				X								K4.01 - Design for cooling of containment penetrations	3.0	
026 Containment Spray								X				A2.08 - Determination of when spray can be secured	3.7	1
056 Condensate								X				A2.04 - Predict impacts of loss of condensate pumps	2.8	1
059 Main Feedwater	X											K1.02 - Cause / effect between MFW and AFW	3.4	1
061 Auxiliary/Emergency Feedwater (PSA)						X						K6.01 - Effect of loss of controllers / positioners on AFW	2.8	1
063 DC Electrical Distribution		X										K2.01 - Power to major DC loads	3.1	1
068 Liquid Radwaste											X	2.1.32 - Explain / apply system limits and precautions	3.8	1
071 Waste Gas Disposal											X	2.2.25 - Bases in tech specs for LCOs and safety limits	3.7	1
072 Area Radiation Monitoring			X									K3.01 - Effect of loss of ARM on containment vent isolation	3.4	1
K/A Category Totals:	1	2	2	2	2	2	1	2	1	1	3	Group Point Total:	19	

ES-401		PWR SRO Examination Outline Plant Systems - Tier 2/Group 2										Form ES-401-3		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						X						K6.03 - Effect of loss on RVLIS	3.6	1
006 Emergency Core Cooling										X		A4.08 - Operate / monitor ESF, including reset	4.3	1
010 Pressurizer Pressure Control	X											K1.06 - Cause / effect between PCS and CVCS	3.1	1
011 Pressurizer Level Control					X							K5.06 - Indicated charging flow - seal flow plus actual charging flow	3.2	1
012 Reactor Protection	X											K1.08 - Cause / effect between RPS and MFW	3.1	1
016 Non-nuclear Instrumentation				X								K4.03 - Design of input to control systems	2.9	1
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge				X								K4.02 - Design regarding negative pressure in containment	3.1	1
033 Spent Fuel Pool Cooling								X				A2.03 - Predict impact of abnormal spent fuel pool water level or loss of level	3.5	1
034 Fuel Handling Equipment														
035 Steam Generator									X			A3.01 - Monitor SG water level control	3.9	1
039 Main and Reheat Steam							X					A1.05 - Predict effect of changes on RCS Tave	3.3	1
055 Condenser Air Removal			X									K3.01 - Effect of loss of CARS on main condenser	2.7	1
062 AC Electrical Distribution											X	2.1.27 - Knowledge of system purpose / function	2.9	1
064 Emergency Diesel Generator			X									K3.03 - Effect of loss of EDG on manual loads	3.9	1
073 Process Radiation Monitoring										X		A4.02 - Operate / monitor rad monitor panel	3.7	1
075 Circulating Water											X	2.1.25 - Obtain / interpret station reference materials such as graphs and tables	3.1	1
079 Station Air														
086 Fire Protection							X					A1.01 - Predict effect of changes on fire header pressure	3.3	1
103 Containment										X		A4.06 - Operate / monitor containment personnel airlock door	2.9	1
K/A Category Totals:	2	0	2	2	1	1	2	1	1	3	2	Group Point Total:		17

PWR SRO Examination Outline Plant Systems - Tier 2/Group 3												Form ES-401-3		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal				X								K4.08 - Lineup for piggy back mode with HP injection	3.5	1
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water		X										K2.02 - Power to CCW pumps, including emergency backup	3.2	1
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator							X					A1.06 - Expected response of secondary plant parameters following TG trip	3.7	1
076 Service Water														
078 Instrument Air	X											K1.03 - Cause / effect between IAS and containment air	3.4	1
K/A Category Totals:	1	1	0	1	0	0	1	0	0	0	0	Group Point Total:		4
Plant-Specific Priorities														
System/Topic	Recommended Replacement for ...						Reason						Points	
Plant-Specific Priority Total: (limit 10)														

Facility: HARRIS		Date of Exam: 08/26/2002	Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.33	Recognize indications for system operating parameters which are entry-level conditions for tech specs.	4.0	1
	2.1.25	Obtain / interpret station reference materials such as graphs, monographs, and tables.	3.1	1
	2.1.10	Knowledge of conditions and limitations in facility license.	3.9	1
	2.1.2	Knowledge of operator responsibilities during all modes of operations.	4.0	1
	2.1.4	Knowledge of shift staffing requirements.	3.4	1
	Total			5
Equipment Control	2.2.25	Knowledge of bases in tech specs for LCOs and safety limits.	3.7	1
	2.2.24	Analyze the effect of maintenance activities on LCO status.	3.8	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.8	1
	2.2.26	Knowledge of refueling administrative requirements.	3.7	1
	Total			4
Radiation Control	2.3.4	Radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
	2.3.10	Perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
	2.3.11	Ability to control radiation releases.	3.2	1
	Total			3
Emergency Procedures/ Plan	2.4.21	Knowledge of parameters and logic used to assess the status of safety functions.	4.3	1
	2.4.2	System setpoints, interlocks, and automatic actions associated with EOP entry conditions.	4.1	1
	2.4.7	Knowledge of event based EOP mitigation strategies.	3.8	1
	2.4.41	Knowledge of emergency action level thresholds and classifications.	4.1	1
	2.4.4	Recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
	Total			5
Tier 3 Point Total				17

Facility: HARRIS		Date of Exam: 8/26/2002		Exam Level: RO										
Tier	Group	K/A Category Points											Point Total	
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		
1 Emergency & Abnormal Plant Evolutions	1	2	2	4				3	3			2	16	
	2	3	2	3				3	4			2	17	
	3	0	0	0				2	1			0	3	
	Tier Totals	5	4	7				8	8			4	36	
2 Plant Systems	1	2	3	2	2	2	2	2	2	2	2	2	23	
	2	2	1	2	2	1	1	2	2	1	3	3	20	
	3	1	1	0	1	0	0	1	0	0	2	2	8	
	Tier Totals	5	5	4	5	3	3	5	4	3	7	7	51	
3 Generic Knowledge and Abilities						Cat 1		Cat 2		Cat 3		Cat 4		13
						4		3		3		3		
Notes:														
1	Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).													
2	The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final exam must total 100 points.													
3	Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.													
4	Systems/evolutions within each group are identified on the associated outline.													
5	The shaded areas are not applicable to the category/tier.													
6*	The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.													
7	On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.													
8	Shaded topics on individual Tier / Group pages indicate topic is RO ONLY.													

*Final
Submission*

ES-401		PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1							Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points	
000005 Inoperable/Stuck Control Rod / 1	X						AK1.02 - Implications of inoperable / stuck rod on flux tilt	3.1	1	
000015/17 RCP Malfunctions / 4				X			AA1.08 - Operate / monitor SG LCS during loss of RCS flow	3.0	1	
W/E09&E10 Natural Circ. / 4	X						EK1.02 - Normal, abnormal, and emergency procedures associated with NC operations	3.3	1	
000024 Emergency Boration / 1		X					AK2.01 - Interrelationship between Emergency Boration and valves	2.7	1	
000026 Loss of Component Cooling Water / 8			X				AK3.01 - Conditions that will initiate automatic operation of SWS valves to CCW coolers	3.2	1	
000027 Pressurizer Pressure Control System Malfunction / 3					X		AA2.15 - Actions if PCS instrument fails high	3.7	1	
000040 (W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				X			000040AA1.22 - Operate / monitor load sequencer status lights during a steam line rupture	3.0	1	
W/E08 RCS Overcooling - PTS / 4		X					EK2.02 - Heat removal systems, and relationship between proper operation of systems during PTS event	3.6	1	
000051 Loss of Condenser Vacuum / 4			X				AK3.01 - Loss of steam dump capability upon loss of condenser vacuum	2.8	1	
000055 Station Blackout / 6						X	2.4.18 - Knowledge of specific bases for EOPs	2.7	1	
000057 Loss of Vital AC Elec. Inst. Bus / 6					X		AA2.15 - Determine / interpret that a loss of AC has occurred	3.8	1	
000062 Loss of Nuclear Service Water / 4					X		AA2.06 - Length of time after loss of SWS flow to component until damage to component occurs	2.8	1	
000067 Plant Fire On-site / 9										
000068 Control Room Evac. / 8			X				AK3.09 - Transfer to local control - charging pumps, flow control, PZR heaters, and boric acid transfer pumps	3.9	1	
000069 (W/E14) Loss of CTMT Integrity / 5			X				W/E14EK3.02 - Normal, abnormal, and emergency procedures associated with high containment pressure	3.1	1	
000074 (W/E06&E07) Inad. Core Cooling / 4 (PSA)				X			000074 EA1.05 - Operate / monitor PZR PORV during ICC	3.9	1	
000076 High Reactor Coolant Activity / 9						X	2.4.18 - Knowledge of specific bases for EOPs	2.7	1	
K/A Category Totals:	2	2	4	3	3	2	Group Point Total:		16	

ES-401		PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2							Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points	
000001 Continuous Rod Withdrawal / 1	X						AK1.16 - Definition / application of power defect	3.0	1	
000003 Dropped Control Rod / 1						X	2.4.6 - Knowledge of symptom based EOP strategy	3.1	1	
000007 Reactor Trip - Stabilization - Recovery / 1	X						EK1.03 - Reasons for isolating the TG after a reactor trip	3.7	1	
000008 Pressurizer Vapor Space Accident / 3					X		AA2.12 - Determine / interpret PZR level indicators	3.4	1	
000009 Small Break LOCA / 3			X				EK3.20 - Tech spec RCS leakage limits	3.5	1	
000011 Large Break LOCA / 3 (PSA)				X			EA1.01 - Control of RCS pressure and temp to avoid violating PTS limits during a LBLOCA	3.7	1	
W/E04 LOCA Outside Containment / 3										
W/E03 LOCA Cooledown/Depress. / 4										
W/E11 Loss of Emergency Coolant Recirc. / 4										
W/E01 & E02 Rediagnosis & SI Termination / 3				X			EA1.01 - Components, control / safety systems, including auto / manual operation related to SI Termination	4.0	1	
000022 Loss of Reactor Coolant Makeup / 2						X	2.1.25 - Obtain / interpret station reference materials such as graphs, monographs, and tables.	2.8	1	
000025 Loss of RHR System / 4		X					AK2.05 - Interrelationship between Loss of RHR and reactor building sump	2.6	1	
000029 Anticipated Transient w/o Scram / 1			X				EK3.11 - Reasons for initiating Emergency Boration	4.2	1	
000032 Loss of Source Range NI / 7										
000033 Loss of Intermediate Range NI / 7	X						AK1.01 - Effects of voltage change on IR performance	2.7	1	
000037 Steam Generator Tube Leak / 3				X			AA1.13 - Operate / monitor SGBD rad monitor during tube leak	3.9	1	
000038 Steam Generator Tube Rupture / 3			X				EK3.08 - Criteria for securing RCPs during a SGTR	4.1	1	
000054 Loss of Main Feedwater / 4 (PSA)										
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4		X					EK2.01 - Components, control / safety systems, including auto / manual operation related to Loss of Heat Sink	3.7	1	
000058 Loss of DC Power / 6					X		AA2.03 - Determine / interpret DC loads lost; impact on ability to operate / monitor plant systems	3.5	1	
000059 Accidental Liquid RadWaste Rel. / 9					X		AA2.03 - Failure modes, symptoms, and causes of misleading indications on liquid rad monitor	3.1	1	
000060 Accidental Gaseous Radwaste Rel. / 9					X		AA2.06 - Determine / interpret valve lineup for release of rad gases	3.6	1	
000061 ARM System Alarms / 7										
W/E16 High Containment Radiation / 9										
K/A Category Totals:	3	2	3	3	4	2	Group Point Total:		17	

ES-401	PWR RO Examination Outline							Form ES-401-4		
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points	
000028 Pressurizer Level Malfunction / 2										
000036 Fuel Handling Accident / 8				X			AA1.04 - Operate / monitor fuel handling equipment during incident	3.1	1	
000056 Loss of Off-site Power / 6					X		AA2.22 - Determine / interpret lube oil pump indicators and low pressure alarms on EDG	3.4	1	
000065 Loss of Instrument Air / 8				X			AA1.02 - Operate / monitor components served by IAS to minimize drain on system	2.6	1	
W/E13 Steam Generator Over-pressure / 4										
W/E15 Containment Flooding / 5										
					</					

PWR RO Examination Outline Plant Systems - Tier 2/Group 1												Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive		X										K2.02 - One line diagram of PS to trip breakers	3.6	3
				X								K4.11 - Design for resetting CRDM ckt breakers	2.7	
					X							K5.42 - Definition of Tave and no load Tave	2.9	
003 Reactor Coolant Pump	X											K1.03 - Cause / effect between RCP and RCP seals	3.3	2
										X		A4.08 - Operate / monitor RCP cooling supplies	3.2	
004 Chemical and Volume Control			X									K3.08 - Effect of loss of CVCS on RCP seal injection	3.6	3
							X					A1.06 - Monitor changes in VCT level	3.0	
									X			A3.08 - Monitor CVCS changes on reactor power	3.9	
013 Engineered Safety Features Actuation						X						K6.01 - Effect of loss of sensors / detectors on ESFAS	2.7	2
								X				A2.01 - Predict impacts of LOCA on ESFAS	4.6	
015 Nuclear Instrumentation					X							K5.06 - Implication of subcritical multiplication on NIS	3.4	2
										X		A4.03 - Operate / monitor NIS trip bypasses	3.8	
017 In-core Temperature Monitor									X			A3.01 - Incore temp indications of normal, natural, and interrupted circulation of RCS	3.6	1
022 Containment Cooling		X										K2.01 - Power supplies to containment cooling	3.0	2
				X								K4.01 - Design for cooling of containment penetrations	2.5	
056 Condensate								X				A2.04 - Predict impacts of loss of condensate pumps	2.6	1
059 Main Feedwater	X											K1.02 - Cause / effect between MFW and AFW	3.4	2
							X					A1.03 - Power level restrictions for operation of MFW pumps and valves	2.7	
061 Auxiliary/Emergency Feedwater (PSA)		X										K2.02 - Power supplies to AFW electric pumps	3.7	2
						X						K6.01 - Effect of loss of controllers / positioners on AFW	2.5	
068 Liquid Radwaste											X	2.1.32 - Explain / apply system limits and precautions	3.4	1
071 Waste Gas Disposal											X	2.2.25 - Bases in tech specs for LCOs and safety limits	2.5	1
072 Area Radiation Monitoring			X									K3.01 - Effect of loss of ARM on containment vent isolation	3.2	1
K/A Category Totals:	2	3	2	2	2	2	2	2	2	2	2	Group Point Total:		23

ES-401		PWR RO Examination Outline Plant Systems - Tier 2/Group 2											Form ES-401-4	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						X						K6.03 - Effect of loss on RVLIS	3.1	1
006 Emergency Core Cooling										X		A4.08 - Operate / monitor ESF, including reset	4.2	1
010 Pressurizer Pressure Control	X											K1.06 - Cause / effect between PCS and CVCS	2.9	1
011 Pressurizer Level Control					X							K5.06 - Indicated charging flow - seal flow plus actual charging flow	2.9	1
012 Reactor Protection	X											K1.08 - Cause / effect between RPS and MFW	2.9	1
014 Rod Position Indication											X	2.1.11 - Less than one hour tech spec actions	3.0	1
016 Non-nuclear Instrumentation				X								K4.03 - Design of input to control systems	2.8	1
026 Containment Spray								X				A2.08 - Determination of when spray can be secured	3.2	1
029 Containment Purge				X								K4.02 - Design regarding negative pressure in containment	2.9	1
033 Spent Fuel Pool Cooling								X				A2.03 - Predict impact of abnormal spent fuel pool water level or loss of level	3.1	1
035 Steam Generator									X			A3.01 - Monitor SG water level control	4.0	1
039 Main and Reheat Steam							X					A1.05 - Predict effect of changes on RCS Tave	3.2	1
055 Condenser Air Removal			X									K3.01 - Effect of loss of CARS on main condenser	2.5	1
062 AC Electrical Distribution											X	2.1.27 - Knowledge of system purpose / function	2.8	1
063 DC Electrical Distribution		X										K2.01 - Power to major DC loads	2.9	1
064 Emergency Diesel Generator			X									K3.03 - Effect of loss of EDG on manual loads	3.6	1
073 Process Radiation Monitoring										X		A4.02 - Operate / monitor rad monitor panel	3.7	1
075 Circulating Water											X	2.1.25 - Obtain / interpret station reference materials such as graphs and tables	2.8	1
079 Station Air										X		A4.01 - Operate / monitor crosstie with IAS	2.7	1
086 Fire Protection							X					A1.01 - Predict effect of changes on fire header pressure	2.9	1
K/A Category Totals:	2	1	2	2	1	1	2	2	1	3	3	Group Point Total:		20

PWR RO Examination Outline Plant Systems - Tier 2/Group 3												Form ES-401-4		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal				X								K4.08 - Lineup for piggy back mode with HP injection	3.1	1
007 Pressurizer Relief/Quench Tank										X		A4.04 - Operate / monitor PZR vent valve	2.6	1
008 Component Cooling Water		X										K2.02 - Power to CCW pumps, including emergency backup	3.0	1
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control											X	2.1.27 - Knowledge of system purpose / function	2.8	1
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator							X					A1.06 - Expected response of secondary plant parameters following TG trip	3.3	1
076 Service Water											X	2.4.10 - Knowledge of annunciator response	3.0	1
078 Instrument Air	X											K1.03 - Cause / effect between IAS and containment air	3.3	1
103 Containment											X	A4.06 - Operate / monitor containment personnel airlock door	2.7	1
K/A Category Totals:	1	1	0	1	0	0	1	0	0	2	2	Group Point Total:		8
Plant-Specific Priorities														
System/Topic	Recommended Replacement for ...										Reason	Points		
Plant-Specific Priority Total: (limit 10)														

Facility: HARRIS		Date of Exam: 08/26/2002		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.29	Knowledge of how to conduct and verify valve lineups.	3.4	1	
	2.1.25	Obtain / interpret station reference materials such as graphs, monographs, and tables.	2.8	1	
	2.1.20	Ability to execute procedural steps.	4.3	1	
	2.1.2	Knowledge of operator responsibilities during all modes of operations.	3.0	1	
Total				4	
Equipment Control	2.2.12	Knowledge of surveillance procedures.	3.0	1	
	2.2.24	Analyze the effect of maintenance activities on LCO status.	2.6	1	
	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1	
Total				3	
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5	1	
	2.3.10	Perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	1	
	2.3.11	Ability to control radiation releases.	2.7	1	
Total				3	
Emergency Procedures/ Plan	2.4.19	Knowledge of EOP layout, symbols, and icons.	2.7	1	
	2.4.2	System setpoints, interlocks, and automatic actions associated with EOP entry conditions.	3.9	1	
	2.4.7	Knowledge of event based EOP mitigation strategies.	3.1	1	
Total				3	
Tier 3 Point Total				13	