

Final Submittal

(Blue Paper)

1. Senior Operator Written Examination
AND REFERENCES

**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

K/A 055K301

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

B/A 061A3.03

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)

K/A 022A3.01

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.

K/A 0712.2.25

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

K/A 025AK2.05

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

IK/A 056A2.04

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.

K/A 065AA2.08

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

K/A G.2.2.24

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

K/A 001K4.11

QUESTION: 10

The plant is in Mode 1.

When entering the Personnel Air Lock, how is the inside door checked closed and what would be the consequences of attempting to enter with the inside door open?

- a.
 - The outside door contains a visual indication (red/green light) of the inside door's position
 - Technical Specifications would be violated

- b.
 - The equalizing valve will **NOT** open if the inside door is open
 - Technical Specifications would be violated

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

- d.
 - The equalizing valve will **NOT** open if the inside door is open
 - An interlock will prevent entry if the inside door is open

ANSWER:

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

K/A 103K4.04

QUESTION: 11

Given the following conditions:

- Containment Pressure Channel I, PT-950A, is in TEST for surveillance testing purposes.
- Containment Pressure Channel III, 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

K/A 013K6.01

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

K/A G.2.3.11

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

K/A 0552.4.18

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.

K/A 0762.4.18

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

K/A 016K4.03

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 overcurrent trip setpoints
- 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

K/A 0622.1.27

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

K/A 0222.1.25

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

K/A 062AA2.06

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

K/A 0752.1.25

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 $< 75\%$

K/A G, 2, 1, 25

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 INITIAL response of the rod control system?

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

ANSWER:

- d. Step in at 72 steps per minute to reduce Tavg to 557°F

K/A 001K5.42

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.

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

K/A 010K1.06

QUESTION: 23

Given the following conditions:

- Feed water flow is being transferred from the Main Feed Regulating Bypass Valves to the Main Feed Regulating Valves.
- All six (6) valves are in MANUAL control and are open.
- A reactor trip occurs and RCS Tavg stabilizes at no-load conditions.

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

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

ANSWER:

- c.
 - Main Feed Regulating Valves CLOSED
 - Main Feed Regulating Bypass Valves OPEN

K/A 012K1.08

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

K/A 029K4.02

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

K/A 063K2.01

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.~~

cpm Only normal letdown is 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.

K/A 011K5.06

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.

K/A 086A1.01

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.
- All of the operator's dose has been received while working at Harris Nuclear Plant.

What is the **MAXIMUM** time that the operator may work in this area and still remain within CP&L's Annual Administrative Dose Limit?

- One (1) hour
- Eleven (11) hours
- Fifty-one (51) hours
- Seventy-one (71) hours

ANSWER:

- Eleven (11) hours

K/A G.2.3.10

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?

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

ANSWER:

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

K/A 015/017AA1.08

**Harris Nuclear Plant
August 2002 – SRO Exam
ANSWER KEY**

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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K/A 040AAI.22

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

K/A 022K2.01

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

K/A 004A1.06

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 design features is associated with this evolution AND what is the basis for this design feature?

- a. A key-operated interlock is used to prevent aligning CCW Pumps 'A' and 'C' to 6.9 KV Bus 1A-SA simultaneously
- b. A key-operated interlock is used to prevent aligning CCW Pump 'C' to 6.9 KV Buses 1A-SA and 1B-SB simultaneously
- c. A common breaker is used to prevent aligning CCW Pumps 'A' and 'C' to 6.9 KV Bus 1A-SA simultaneously
- d. A common breaker is used to prevent aligning CCW Pump 'C' to 6.9 KV Buses 1A-SA and 1B-SB simultaneously

ANSWER:

- a. A key-operated interlock is used to prevent aligning CCW Pumps 'A' and 'C' to 6.9 KV Bus 1A-SA simultaneously

K/A 008K4.07

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%.

K/A DOIAKI.16

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 Technical Specification action, if any, that must be taken within one (1) hour for these conditions?

- a. **NO** actions are required
- b. Realign rods F10 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

K/A 0142.1.11

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

K/A G. 2. 1. 2

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.

K/A 005K4.08

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."

K/A 033A2.03

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%

K/A 002K6-03

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

K/A 059AA2.05

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 below 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

K/A G.2.4.7

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.

K/A 0032.4.6

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

K/A 003A4.08

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.

K/A 039A1.05

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'

MA 072K3.01

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.

K/A 026AK3.01

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

K/A 026A2.08

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

K/A 078K1.03

QUESTION: 49

Given the following conditions:

- The unit is operating at 100% power.
- A turbine trip signal is received.
- All automatic actions occur, **EXCEPT** one (1) Throttle Valve fails to close.

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**

K/A 045 A1.06

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.

K/A W/E 09EK1.02

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

K/A 059K1.02

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

K/A 056AA2.22

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

K/A 008AA2.12

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

K/A 015K5.06

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.

K/A 068K1.07

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

K/A 058AA2.03

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

K/A 004K3.08

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 out-of-service.
- 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 criteria 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

K/A 017A3.01

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

K/A G.2.2.13

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

K/A 064K3.03

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

K/A W/E 08EK2.02

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

K/A 073A4.02

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?"

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

ANSWER:

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

K/A 011EA1.01

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

K/A W/E05EK2.01

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

K/A 007EK1.03

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

K/A 027AA2.15

QUESTION: 67

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

- The reactor trip breakers open.
- ALB-15-2-2, PIC 1-2-3-4-9-10-13-14 POWER FAILURE, alarms.
- ALB-15-4-3, PIC 17-18 POWER FAILURE, alarms.
- 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.
- ALB-15-1-4, 60 KVA UPS TROUBLE, remains clear.
- ALB-15-1-5, 7.5 KVA UPS TROUBLE, remains clear.
- ALB-15-3-2, PIC 5-6-7-8-11-12-15-16 POWER FAILURE, remains clear.
- ALB-15-5-3, PIC 19 POWER FAILURE, remains clear.

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

K/A 057AA2.15

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. Stabilizes and remains constant
- c. Increases and stabilizes at full scale
- d. Stabilizes and then increases

ANSWER:

- a. Stabilizes and then decreases

K/A 037AA1.13

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 $>1400^{\circ}\text{F}$.
- 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

K/A 074EA1.05

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 caused the 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

K/A G.2.4.2

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

K/A 068AA1.21

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

K/A D35A3.01

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

K/A 038EK3.08

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

K/A 006A4.D8

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 ...

- adequate shutdown margin is established since the criteria for exiting FRP-S.1 is only that the reactor be subcritical.
- the reactor becomes subcritical since the criteria for exiting FRP-S.1 is only that the power range channels indicate $< 5\%$.
- 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.
- 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:

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

K/A 1029EK3.12

QUESTION: 76

Given the following conditions:

- At 0645, both RHR pumps were declared 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

K/A 6.2.4.30

QUESTION: 77

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

K/A 028AA2.02

**Harris Nuclear Plant
August 2002 – SRO Exam
ANSWER KEY**

ENSURE OST-1093 ATTACHMENT INSERTED HERE

(REMOVE THIS PAGE WHEN INSERTED)

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.

K/A W/E 14.2.3.10

QUESTION: 79

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

- a. Containment Sump Levels and Containment Ventilation Isolation status
- b. Containment Pressure and Containment Sump Levels
- c. Containment Pressure and Containment Ventilation Isolation status
- d. Containment Sump Levels and Containment Hydrogen Concentration

ANSWER:

- b. Containment Pressure and Containment Sump Levels

KA W/E 16 EA 2.01

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 the S-SO can ensure a replacement will arrive within two hours.
- d. hold the off-going CO until a replacement can relieve the off-going CO.

ANSWER:

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

K/A G. 2.1.4

QUESTION: 81

Given the following conditions:

- On May 1, at 0100, a plant shutdown was initiated from 100% in preparations for conducting a refueling.
- The reactor was shutdown at 1100 on the same date.
- CCW heat exchanger outlet temperature is currently 86.8°F.

When is the **EARLIEST** that fuel movement in the reactor vessel is allowed to begin?

- a. May 5th at 0500
- b. May 5th at 1500
- c. May 6th at 0100
- d. May 6th at 1100

ANSWER:

- d. May 6th at 1100

K/A 0362.2.28

QUESTION: 82

Which of the following satisfies the Technical Specification bases requirement for off-site power distribution?

- 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)

K/A G. 2.2.25

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.
- He estimates that it will take up to 4 hours to load the assemblies in the vicinity of the hot legs.

Which of the following identifies the **MAXIMUM** number of consecutive hours the RHR system may be secured under these conditions?

- a. 1 hour
- b. 2 hours
- c. 3 hours
- d. 4 hours

ANSWER:

- a. 1 hour

K/A G. 2. 2. 26

QUESTION: 84

A group of armed intruders is attempting to enter the Protected Area. Security has notified the Control Room that a deviation from the Security Plan is necessary to combat the intruders.

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

ANSWER:

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

K/A G.2.2.28

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 15%.
- 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”

K/A 0542.4.16

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.

K/A G.2.1.33

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?

- Unlock and close 1SI-2, BIT Inlet, **ONLY**
 - Establish normal charging flow while waiting for 1SI-2 to be closed
- Unlock and close 1SI-2, BIT Inlet, **ONLY**
 - Wait until 1SI-2 is closed before establishing normal charging flow
- 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
- 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:

- 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

K/A W/E02EA2.02

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

K/A W/E032.4.22

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"

K/A 0552.4.1

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.

K/A G.2.4.40

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"

K/A 0242.1.20

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

K/A W/E06EA2.01

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 **MINIMIZE** SI flow while still maintaining the minimum required flow 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

K/A W/E11EA2.02

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

K/A 0332.4.4

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

K/A G.2.4.14

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"

K/A G.2.4.4

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

K/A W/ED4EA2.01

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

K/A 005AA2.03

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 Bus 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 Bus B

14/A 067AA2.13

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

K/A 009EA 2.01

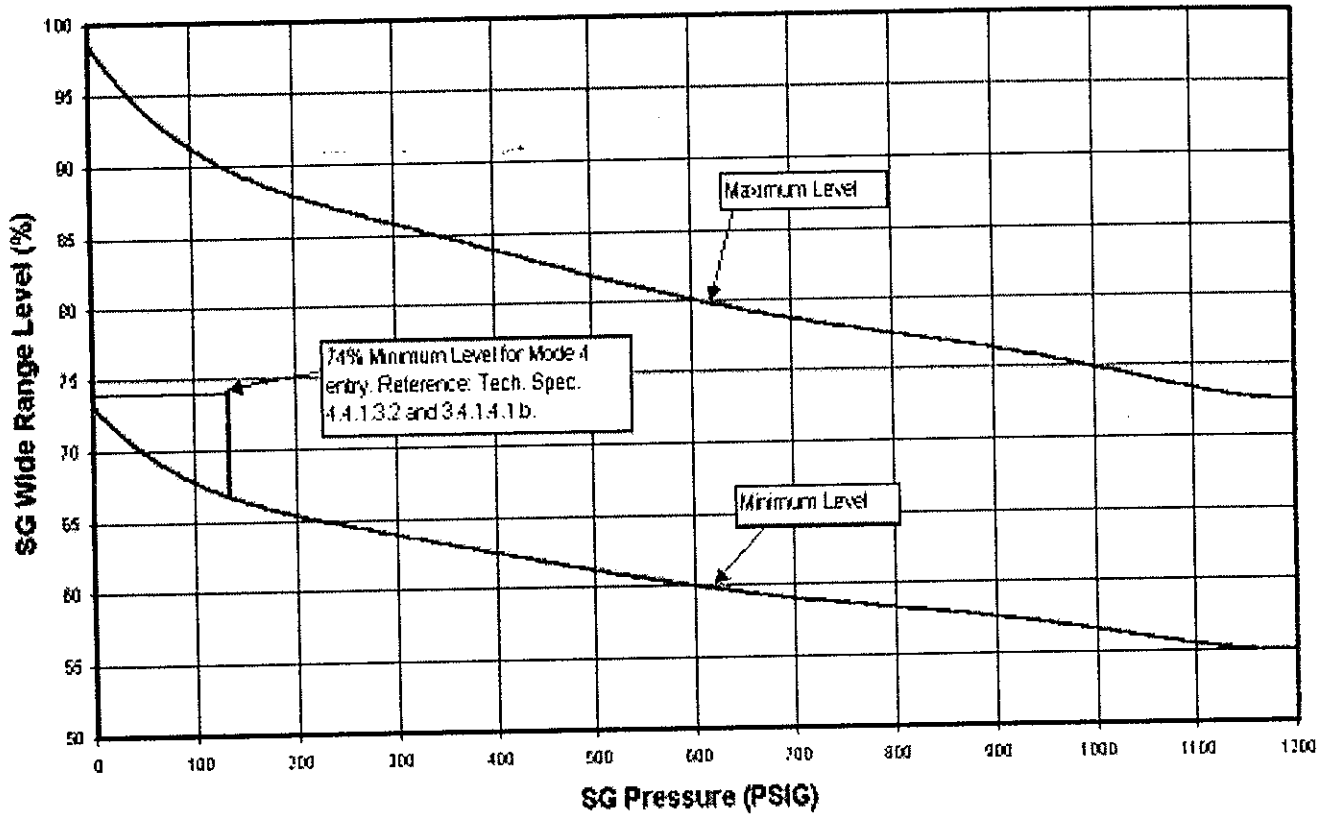
SRO SUPPLIED REFERENCES

AOP-036, Attachment 6	SG Wide Range Level vs. SG Pressure
AP-617, Attachment 1	Immediate Notification Requirements
EPP-012, Attachment 1	Minimum SI Flow Rate vs Time After Reactor Trip
OP-107, Attachment 19	Makeup Concentration Limits
OP-141, Attachment 5	Cooling Tower Cold Weather Operation
PLP-114, Attachment 2	Refueling Operations
Curves A-11-6 through -11	Differential and Integral Rod Worth Curves
Curves C-11-1 through -3	Power Defect Curves
Steam Tables	

Attachment 6

Sheet 1 of 1

SG Wide Range Level vs. SG Pressure



- END ATTACHMENT 6 -

IMMEDIATE NOTIFICATION REQUIREMENTS

The following tables are divided into sections based upon the time allowed for reporting the respective events as follows:

- I One Hour Notifications
- II Four Hour Notifications
- III Eight Hour Notifications
- IV Twenty-four Hour Notifications

NOTE: The events listed in this attachment may be concurrent with conditions that result in a declared emergency. In the case of a declared emergency, the notification made under the Emergency Plan and implementing procedures satisfies the notifications required by this procedure. Written reports will be based on §50.73 and Technical Specifications regardless of whether the initial notification is made under the Emergency Plan or this procedure.

I. ONE HOUR NOTIFICATIONS

- I.A. OPERATIONAL EVENTS -10 CFR 50.72 (b) (1)
 - 1. Technical Specification Deviations (10 CFR 50.54x)
 - 2. Safety Limit Violation (TS 6.7.1)
- I.B. RADIOLOGICAL EVENTS
 - 1. Radioactive Shipments (Note 1)
 - 2. Loss or Theft of Licensed Material/Radiological Sabotage (Note 2)
 - 3. Exposure to Individuals or Releases (Note 3)
 - 4. Accidental Criticality in the Fuel Handling Building (Note 4)
- I.C. SECURITY THREAT (Note 10)
 - 1. Adversary Threat
 - 2. Security Program Vulnerabilities
 - 3. International Atomic Energy Agency (IAEA) Representative
- I.D. FITNESS FOR DUTY (Note 11)
 - 1. FFD - NRC Employee

IMMEDIATE NOTIFICATION REQUIREMENTS

II. FOUR HOUR NOTIFICATIONS

OPERATIONAL EVENTS 10 CFR 50.72 (b) (2)

1. Initiation of any Nuclear Plant Shutdown required by Technical Specifications.
2. Unplanned Actuation of the reactor protection system (scram) when the reactor was critical and any event that results or should have resulted in ECCS discharge into the RCS.
3. Off-Site Notification Has Been or Will Be Made

III. EIGHT HOUR NOTIFICATIONS

1. Degraded or Unanalyzed Condition
2. Loss of Emergency Response Capability (Note 5)
3. Unplanned Actuation of selected ESF Systems
Refer to NUREG 1022 System Actuation to identify applicable system actuations.
4. Loss of a Safety Function
5. Transport of Contaminated Individual

IV. TWENTY-FOUR HOUR NOTIFICATIONS

1. EXPOSURE TO INDIVIDUALS OR RELEASES
 - a. Radiological Exposure/Release (Note 6)
 - b. Other Releases (Note 7)
2. VIOLATION OF OPERATING LICENSE CONDITIONS (Note 8)
3. FITNESS FOR DUTY PROGRAM EVENTS (Note 9)

NOTES
IMMEDIATE NOTIFICATION REQUIREMENTS

<u>NOTIFICATION</u>	<u>REFERENCE</u>	<u>WRITTEN FOLLOW-UP</u>
1. <u>RADIOACTIVE SHIPMENTS</u>		
Removable contamination from a received package containing radioactive material in excess of the limits specified in §71.87(i)	§20.1906(d)(1) §71.87(i)	NRC Notification Also Required per §20.1906(d)(1)
Radiation levels from a received package of radioactive material in excess of the limits specified in §71.47.	§20.1906(d)(2) §71.47	NRC Notification Also Required per §20.1906(d)(2)
The involved H.P. Supervisor shall immediately notify the final delivery carrier. Follow-up NRC notification shall be made by Regulatory Affairs	§20.1906(d)(1)	
Security threats or theft of licensed material shall be reported to site Security personnel. After initial notification or after submission of 30 day report, additional information shall be reported to NRC as it is available and within 30 days of discovering additional information. Per §73.71(a)(5) and §73.71(b)(2), significant supplemental information which becomes available after the initial telephonic notification or after the submission of the written report must be telephonically reported to the NRC Operations Center and also submitted in a revised written report. (Written reports will be submitted on USNRC Form 366 and will be provided a number unique to Safeguards Events. These reports will not be a part of the AEOD tracking program for LERs.)	§73.71(a)(5) §73.71(b)(2)	
2. <u>LOSS OR THEFT OF LICENSED MATERIAL/ RADIOLOGICAL SABOTAGE</u>		
Any loss or theft or attempted theft of:		
a) Licensed material in an aggregate quantity equal to or greater than 1,000 times the quantity specified in Appendix C to §20.1000-§20.2401 under such circumstances that it appears that an exposure could result to persons in unrestricted areas,	§20.2201(a)(1)(i) §20.2201(d) §70.52(b)	30 Day Written Report also required per §20.2201(b)
b) Any Special Nuclear Material or spent fuel,	§73.71(a) (loss/theft only) §74.11 §150.16(b)	30 Day Written Report also required per §73.71(a) 15 Day Written Report may also be required per §150
c) Greater than 10 curies of tritium at any one time or 100 curies in one calendar year, or	§30.55(c)	15 Day Written Report also required
d) More than 15 pounds of uranium or thorium at any one time or more than 150 pounds in one calendar year.	§40.64(c) §150.17(c)	15 Day Written Report also required
Recovery of or accounting for loss of any shipment of Special Nuclear Material or spent fuel	§73.71(a)	

NOTES
IMMEDIATE NOTIFICATION REQUIREMENTS

<u>NOTIFICATION</u>	<u>REFERENCE</u>	<u>WRITTEN FOLLOW-UP</u>
Security threats or theft of licensed material shall be reported to site Security personnel. After initial notification or after submission of 30 day report, additional information shall be reported to NRC as it is available and within 30 days of discovering additional information. Per §73.71(a)(5) and §73.71(b)(2), significant supplemental information which becomes available after the initial telephonic notification or after the submission of the written report must be telephonically reported to the NRC Operations Center and also submitted in a revised written report. (Written reports will be submitted on USNRC Form 366 and will be provided a number unique to Safeguards Events. These reports will not be a part of the AEOD tracking program for LERs.)	§73.71(a)(5) §73.71(b)(2)	
3. <u>EXPOSURE TO INDIVIDUALS OR RELEASES</u>		
Any event involving by-product, source or Special Nuclear Material that may have caused or threatens to cause:		
a) An individual to receive:	§20.2202(a)(1)	LER required by §50.73(a)(2)(viii), (a)(2)(ix) and §20.2203
1) A total effective dose equivalent of ≥ 25 Rem		
2) An eye dose equivalent of ≥ 75 Rem		
3) A shallow-dose equivalent to the skin or extremities of ≥ 250 Rad		
4) An intake of 5 ALI in 24 hours		
b) Release of radioactive material in excess of Technical Specification Instantaneous Limits shall be declared an emergency in accordance with PEP-310. The reporting requirements of PEP-310 shall take precedence over the less restrictive times for reporting requirements of §20.2202 and §50.72(b)(2) for releases.	§20.2202(a)(2) §50.72(b)(2)(iv)	LER required by §50.73(a)(2)(viii), (a)(2)(ix) and §20.2203
4. <u>ACCIDENTAL CRITICALITY IN FUEL HANDLING BUILDING</u>		
Accidental criticality of special nuclear material.	§70.52(a)	None

NOTES
IMMEDIATE NOTIFICATION REQUIREMENTS

<u>NOTIFICATION</u>	<u>REFERENCE</u>	<u>WRITTEN FOLLOW-UP</u>
<p>5. <u>LOSS OF EMERGENCY RESPONSE CAPABILITY</u></p> <p>Any event that results in a major loss of assessment capability, offsite response capability, or communications capability (e.g., significant portion of Control Room indication, Emergency Telecommunication System, or offsite notification system).</p> <p>This includes loss of any of the following:</p> <ul style="list-style-type: none">a) All dedicated Emergency Telecommunication System phone links to the NRC, as determined by the Emergency Planning Organization.b) Offsite siren capability for greater than one hour as follows:<ul style="list-style-type: none">i) Greater than 16 of the 81 sirens (20% of system) reported as out of service, orii) All sirens in a single county out of service.c) Selective Signaling System phones from the Control Room, ACP, or EOF to local, county, and state warning points. Reporting is required only if these communication links <u>cannot</u> be compensated for by other readily available off-site communication systems.d) National Weather Service primary <u>and</u> back-up NOAA Weather Radio transmitters at Fayetteville or primary <u>and</u> back-up NOAA Weather Radio transmitters at Durham. The National Weather Service will contact the Control Room if either of these two conditions exists.		

NOTES
IMMEDIATE NOTIFICATION REQUIREMENTS

The following Warning Sirens will not operate when power is lost to the identified transformers. The Control Room staff is to use this table to determine Reportability.

TRANSFRMR	SIREN	COUNTY
1078K	17	Chatham
1447K	20	Chatham
1598K	1	Chatham
1774K	3	Chatham
A250AF	8	Chatham
BQ63AF	6A	Chatham
C180	11	Chatham
CB36AC	53	Chatham
CC090	16	Chatham
CD97AC	24	Chatham
CR13AF	6	Chatham
CS05AF	7	Chatham
CZ64AF	5	Chatham
D697AC	14	Chatham
EMC	9	Chatham
EMC	12	Chatham
L780AF	Z	Chatham
M556AC	49	Chatham
M580AC	27	Chatham
N218AF	54	Chatham
N279BH	55	Chatham
X392AC	41	Chatham
G918BH	Q	Chatham
X595AC	15	Chatham
Z090AC	44	Chatham
Z278AC	52	Chatham
Z561AC	10	Chatham

TRANSFRMR	SIREN	COUNTY
Z885AC	13	Chatham
J047BH	70	Harnett
J445	U	Harnett
G754	80	Harnett
L424BH	57	Harnett
M049	56	Harnett
M086	59	Harnett
P268	69	Harnett
EMC	42	Lee
EMC	45	Lee
EMC	46	Lee
EMC	48	Lee
EMC	58	Lee
V959AC	39 *	Lee
921	28	Wake
12688	40	Wake
1099K	31	Wake
1187K	26	Wake
1394K	21	Wake
2324K	4	Wake
584K	22	Wake
689K	V	Wake
7162K	D	Wake
8371K	72	Wake
951K	19	Wake
APEX CITY	29	Wake
APEX CITY	30	Wake

TRANSFRMR	SIREN	COUNTY
B185	25	Wake
B872BH	38	Wake
B924BH	A	Wake
K684BH	67A	Wake
X462AC	67	Wake
J681BH	63	Wake
J702BH	66	Wake
L166BH	62	Wake
L869BH	48A	Wake
M408	65	Wake
N909	71	Wake
N991	51	Wake
S087BH	32	Wake
S275BH	C	Wake
S551	34	Wake
S716BH	37	Wake
SOLAR	E01	Wake
SOLAR	E02	Wake
SOLAR	E03	Wake
SOLAR	E04	Wake
SOLAR	E05	Wake
SOLAR	E06	Wake
SOLAR	E07	Wake
SOLAR	E08	Wake
SOLAR	E09	Wake
SOLAR	E10	Wake
U343BH	36	Wake

- Note: If power is lost to Siren 39 and the Electric Membership Corporation cannot be contacted, it should be conservatively assumed that power has been lost to all sirens in Lee County.

<u>NOTIFICATION</u>	<u>REFERENCE</u>	<u>WRITTEN FOLLOW-UP</u>
6. <u>RADIOLOGICAL EXPOSURE/RELEASE</u>	(§20.2202(b))	30 Day Written Report Also Required per §20.2203
<p>Any event involving licensed material possessed by the licensee that may have caused or threatens to cause an individual to receive, in a period of 24 hours:</p> <p>a) A total effective dose equivalent > 5 Rem; or</p> <p>b) An eye dose equivalent > 15 Rem; or</p> <p>c) A shallow-dose equivalent to the skin or extremities > 50 Rem; or</p> <p>d) An intake of > 1 ALI.</p>		
7. <u>OTHER RELEASES</u> Any Unusual or Important Environmental Events	Env. Prot. Plan Section 4.1, PLP-500	30 Day Written Report also required

NOTES
IMMEDIATE NOTIFICATION REQUIREMENTS

8. VIOLATION OF OPERATING LICENSE CONDITIONS

- | | | |
|--|-------------------|---------------------------------|
| 1) Any event resulting in the plant operating in a manner which violates the SHNPP Facility Operating License, Section 2.C: | OL Section 2.G | LER required per OL Section 2.G |
| a) Reactor Core Thermal Power Level exceeds 2900 MWt.

Average thermal power level for any eight-hour period exceeding 2900 MWt. Instantaneous thermal power level exceeding 2958 MWt (102%) or average thermal power levels equivalent to 2958 MWt (102%) for a 15-minute period, 2929 MWt (101%) for a 30-minute period, 2914 MWt. (100.5%) for a 60-minute period, shall be used for determination of Reportability | OL Section 2.C.1 | |
| 2) A failure to comply with the following administrative requirements (See Note 1): | | LER required per OL Section 2.G |
| a) Deviation from the requirements of the Environmental Protection Plan; | OL Section 2.C.2 | |
| b) Failure to comply with anti-trust conditions of Appendix C to OL; | OL Section 2.C.3 | |
| c) Failure to comply with new fuel storage requirements. | OL Section 2.C.10 | |

9. FITNESS FOR DUTY PROGRAM EVENTS

- | | | |
|---|-------------------------------|------|
| 1. Sale, use, or possession of illegal drugs within the protected area. | §26.73(a)(1) | None |
| 2. Any acts by any person licensed under §55, or by any supervisory personnel assigned to perform duties within the scope of §26 | §26.73(a)(2) | None |
| a) Involving the sale, use, or possession of a controlled substance,
b) Resulting in a confirmed positive test on such persons,
c) Involving use of alcohol within the protected area, or
d) Resulting in a determination of unfitness for scheduled work due to the consumption of alcohol. | | |
| 3. False positive error on a blind performance test specimen when error is determined to be administrative. | App. A to Part 26 B.2.8(e)(5) | None |

NOTES
IMMEDIATE NOTIFICATION REQUIREMENTS

- | | | | |
|-----|---|--|--|
| 10. | <p><u>ADVERSARY (SECURITY) THREAT (1.C.1)</u>
When specified by Security based on applicable Security Plan Procedure.</p> <p>Security threats or theft of licensed material shall be reported to site Security personnel. After initial notification or after submission of 30 day report, additional information shall be reported to NRC as it is available and within 30 days of discovering additional information. Per §73.71(a)(5) and §73.71(b)(2), significant supplemental information which becomes available after the initial telephonic notification or after the submission of the written report must be telephonically reported to the NRC Operations Center and also submitted in a revised written report. (Written reports will be submitted on USNRC Form 366 and will be provided a number unique to Safeguards Events. These reports will not be a part of the AEOD tracking program for LERs.)</p> | <p>§73.71(b)
§73 App. G</p> <p>§73.71(a)(5)
§73.71(b)(2)</p> | <p>30 Day Written Report also Required per §73.71(d)</p> |
| | <p><u>SECURITY PROGRAM VULNERABILITIES (1.C.2)</u>
When specified by Security based on applicable Security Plan Procedure.</p> <p>Security threats or theft of licensed material shall be reported to site Security personnel. After initial notification or after submission of 30 day report, additional information shall be reported to NRC as it is available and within 30 days of discovering additional information. Per §73.71(a)(5) and §73.71(b)(2), significant supplemental information which becomes available after the initial telephonic notification or after the submission of the written report must be telephonically reported to the NRC Operations Center and also submitted in a revised written report. (Written reports will be submitted on USNRC Form 366 and will be provided a number unique to Safeguards Events. These reports will not be a part of the AEOD tracking program for LERs.)</p> | <p>§73.71(b)
§73 App. G</p> <p>§73.71(a)(5)
§73.71(b)(2)</p> | <p>30 Day Written Report also Required per §73.71(d)</p> |
| | <p><u>INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA) REPRESENTATIVE (1.C.3)</u>
Individual claiming to be an IAEA representative who is not accompanied by an NRC employee and has no prior confirmation of credentials in writing.
Notification is to Director, Office of Nuclear Reactor Regulation</p> | <p>§75.7</p> <p>§75.6 and §75.7</p> | <p>None</p> |
| 11. | <p><u>FITNESS FOR DUTY - NRC EMPLOYEE</u>
Notification of NRC employee's unfitness for duty. Per §26.27(d), the appropriate Regional Administrator must be notified immediately by telephone. During other than normal working hours, the NRC Operations Center must be notified.</p> | <p>§26.27(d)</p> | <p>None</p> |

LOSS OF EMERGENCY COOLANT RECIRCULATION

Attachment 1
 Sheet 1 of 1
 MINIMUM SI FLOW RATE VERSUS TIME AFTER REACTOR TRIP

TIME AFTER REACTOR TRIP	MINIMUM SI FLOW (GPM)
10 TO 15 MINUTES	500
15 TO 20 MINUTES	450
20 TO 25 MINUTES	425
25 TO 30 MINUTES	400
30 TO 40 MINUTES	375
40 TO 50 MINUTES	350
50 TO 60 MINUTES	325
1 TO 1.5 HOURS	300
1.5 TO 2 HOURS	275
2 TO 3 HOURS	250
3 TO 4 HOURS	225
GREATER THAN 4 HOURS	200

- END -

Makeup Concentration Limits

These tables were derived per calculation HNP-I/INST-1056 using the equations of Attachment 3 and provide a means to select an appropriate RWMU Total Makeup Flow Rate (Q) which will yield a desired blended flow boron concentration when matched to the BAT concentration and the Boric Acid Flow Rate span of 1 to 30 gpm.

It is necessary to select lower RWMU Total Makeup Flow Rates when high boron concentrations are required because the Boric Acid Flow is limited by system configuration to a maximum of 33 gpm. This maximum Boric Acid Flow capability however is not used as the basis for these tables because it is necessary to allow some margin for possible system performance degradation. Therefore a maximum Boric Acid Flow of 30 gpm is used as the basis for the following tables.

Each sheet of the tables is applicable to a specific RWMU Total Makeup Flow Rate (Q).

The maximum ppm results have been rounded down to the nearest whole number and the minimum ppm results have been rounded up to the nearest whole number.

Makeup Concentration Limits for: RWMU Total Makeup Flow Rate $Q = 120\text{gpm}$

1. To determine the maximum boron concentration for which makeup will be reliable at 120 gpm total flow, select the BAT boron concentration which is equal to or lower than current BAT boron concentration.
2. To determine the minimum boron concentration for which makeup will be reliable at 120 gpm total flow, select the BAT boron concentration which is equal to or higher than current BAT boron concentration.

BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 120 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 120 GPM MAKEUP (1 GPM BA FLOW)
7000	1750	59
7050	1762	59
7100	1775	60
7150	1787	60
7200	1800	60
7250	1812	61
7300	1825	61
7350	1837	62
7400	1850	62
7450	1862	63
7500	1875	63
7550	1887	63
7600	1900	64
7650	1912	64
7700	1925	65
7750	1937	65

Makeup Concentration Limits for: RWMU Total Makeup Flow Rate Q = 110gpm

1. To determine the maximum boron concentration for which makeup will be reliable at 110 gpm total flow, select the BAT boron concentration which is equal to or lower than current BAT boron concentration.
2. To determine the minimum boron concentration for which makeup will be reliable at 110 gpm total flow, select the BAT boron concentration which is equal to or higher than current BAT boron concentration.

BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 110 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 110 GPM MAKEUP (1 GPM BA FLOW)
7000	1909	64
7050	1922	65
7100	1936	65
7150	1950	65
7200	1963	66
7250	1977	66
7300	1990	67
7350	2004	67
7400	2018	68
7450	2031	68
7500	2045	69
7550	2059	69
7600	2072	70
7650	2086	70
7700	2100	70
7750	2113	71

Makeup Concentration Limits for: RWMU Total Makeup Flow Rate $Q = 100\text{gpm}$

1. To determine the maximum boron concentration for which makeup will be reliable at 100 gpm total flow, select the BAT boron concentration which is equal to or lower than current BAT boron concentration.
2. To determine the minimum boron concentration for which makeup will be reliable at 100 gpm total flow, select the BAT boron concentration which is equal to or higher than current BAT boron concentration.

BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 100 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 100 GPM MAKEUP (1 GPM BA FLOW)
7000	2100	70
7050	2115	71
7100	2130	71
7150	2145	72
7200	2160	72
7250	2175	73
7300	2190	73
7350	2205	74
7400	2220	74
7450	2235	75
7500	2250	75
7550	2265	76
7600	2280	76
7650	2295	77
7700	2310	77
7750	2325	78

Makeup Concentration Limits for: RWMU Total Makeup Flow Rate $Q = 90\text{gpm}$

1. To determine the maximum boron concentration for which makeup will be reliable at 90 gpm total flow, select the BAT boron concentration which is equal to or lower than current BAT boron concentration.
2. To determine the minimum boron concentration for which makeup will be reliable at 90 gpm total flow, select the BAT boron concentration which is equal to or higher than current BAT boron concentration.

BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 90 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 90 GPM MAKEUP (1 GPM BA FLOW)
7000	2333	78
7050	2350	79
7100	2366	79
7150	2383	80
7200	2400	80
7250	2416	81
7300	2433	82
7350	2450	82
7400	2466	83
7450	2483	83
7500	2500	84
7550	2516	84
7600	2533	85
7650	2550	85
7700	2566	86
7750	2583	87

Makeup Concentration Limits for: RWMU Total Makeup Flow Rate Q = 80gpm

1. To determine the maximum boron concentration for which makeup will be reliable at 80 gpm total flow, select the BAT boron concentration which is equal to or lower than current BAT boron concentration.
2. To determine the minimum boron concentration for which makeup will be reliable at 80 gpm total flow, select the BAT boron concentration which is equal to or higher than current BAT boron concentration.

BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 80 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 80 GPM MAKEUP (1 GPM BA FLOW)
7000	2625	88
7050	2643	89
7100	2662	89
7150	2681	90
7200	2700	90
7250	2718	91
7300	2737	92
7350	2756	92
7400	2775	93
7450	2793	94
7500	2812	94
7550	2831	95
7600	2850	95
7650	2868	96
7700	2887	97
7750	2906	97

Makeup Concentration Limits for: RWMU Total Makeup Flow Rate $Q = 70\text{gpm}$

1. To determine the maximum boron concentration for which makeup will be reliable at 70 gpm total flow, select the BAT boron concentration which is equal to or lower than current BAT boron concentration.
2. To determine the minimum boron concentration for which makeup will be reliable at 70 gpm total flow, select the BAT boron concentration which is equal to or higher than current BAT boron concentration.

BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 70 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 70 GPM MAKEUP (1 GPM BA FLOW)
7000	3000	100
7050	3021	101
7100	3042	102
7150	3064	103
7200	3085	103
7250	3107	104
7300	3128	105
7350	3150	105
7400	3171	106
7450	3192	107
7500	3214	108
7550	3235	108
7600	3257	109
7650	3278	110
7700	3300	110
7750	3321	111

Makeup Concentration Limits for: RWMU Total Makeup Flow Rate $Q = 60\text{gpm}$

1. To determine the maximum boron concentration for which makeup will be reliable at 60 gpm total flow, select the BAT boron concentration which is equal to or lower than current BAT boron concentration.
2. To determine the minimum boron concentration for which makeup will be reliable at 60 gpm total flow, select the BAT boron concentration which is equal to or higher than current BAT boron concentration.

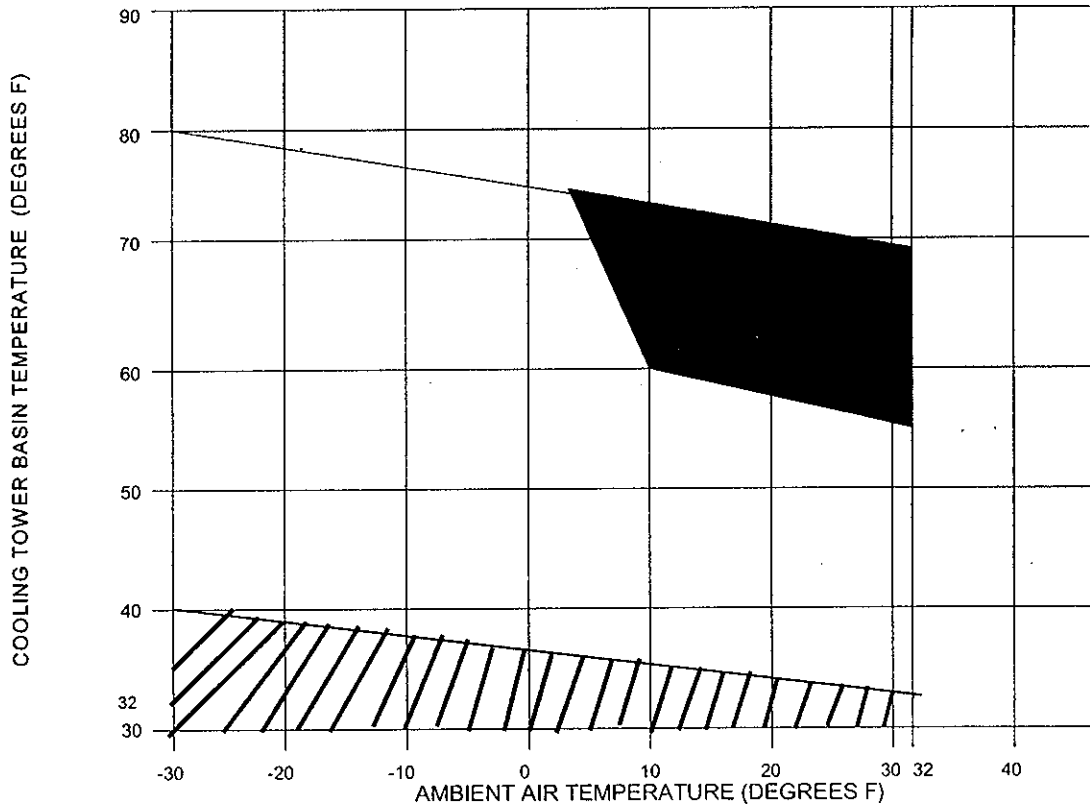
BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 60 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 60 GPM MAKEUP (1 GPM BA FLOW)
7000	3500	117
7050	3525	118
7100	3550	119
7150	3575	120
7200	3600	120
7250	3625	121
7300	3650	122
7350	3675	123
7400	3700	124
7450	3725	125
7500	3750	125
7550	3775	126
7600	3800	127
7650	3825	128
7700	3850	129
7750	3875	130

Makeup Concentration Limits for: RWMU Total Makeup Flow Rate $Q = 50\text{gpm}$

1. To determine the maximum boron concentration for which makeup will be reliable at 50 gpm total flow, select the BAT boron concentration which is equal to or lower than current BAT boron concentration.
2. To determine the minimum boron concentration for which makeup will be reliable at 50 gpm total flow, select the BAT boron concentration which is equal to or higher than current BAT boron concentration.

BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 50 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 50 GPM MAKEUP (1 GPM BA FLOW)
7000	4200	140
7050	4230	141
7100	4260	142
7150	4290	143
7200	4320	144
7250	4350	145
7300	4380	146
7350	4410	147
7400	4440	148
7450	4470	149
7500	4500	150
7550	4530	151
7600	4560	152
7650	4590	153
7700	4620	154
7750	4650	155

Cooling Tower Cold Weather Operation



NORMAL OPERATION - COOLING TOWER DEICING GATE VALVES OPEN
 ■ AS IS - COOLING TOWER DEICING GATE VALVES REMAIN AS IS
 ▨ HALF OPEN - COOLING TOWER DEICING GATE VALVES HALF OPEN
 ▩ ABNORMAL OPERATION - "NO CONDENSER HEAT LOAD" AREA. IN THIS AREA PERFORM SECTION 8.6.

Questioned by applicant that shading was missing for Naval ops area. Validated he was correct and provided printed copies with all shading to applicants.

Refueling Operations

1.0 OPERATIONAL REQUIREMENTS - DECAY TIME

1.1 The reactor shall be subcritical for a minimum period of time as determined by Table A.

APPLICABILITY: During movement of irradiated fuel in the reactor vessel.

ACTION:

With the reactor subcritical for a time less than determined by Table A, suspend all operations involving movement of irradiated fuel in the reactor vessel. Fuel movement in the reactor vessel may continue provided the minimum decay time is greater than the time shown on Table A.

2.0 SURVEILLANCE REQUIREMENTS

2.1 The reactor shall be determined to have been subcritical for a minimum period of time as determined using Table A by verification of the date and time of subcriticality prior to movement of irradiated fuel in the reactor vessel.

2.2 CCW temperature shall be monitored every 12 hours during the movement of fuel in the reactor vessel to ensure the temperature used to determine decay time is not exceeded.

Table A

Time from Reactor Subcritical (Hours)	Effective CCW Temperature (°F)
100	88.9
120	91.8
144	94.3
168	96.2
192	97.9
216	99.1
240	100.2

NOTE 1: - Linear interpolation between listed points is acceptable.

NOTE 2: - These delay times are applicable to end of cycle full core off-loads only. A mid-cycle core off-load assumes two CCW and Fuel Pool Cooling trains available and does NOT require compliance with these limits.

NOTE 3: - Effective CCW temperature refers to actual CCW heat exchanger outlet temperature plus 5°F.

NOTE 4: - The table assumes the core off-load duration is 39 hours or greater.

Refueling Operations

3.0 OPERATION REQUIREMENTS - COMMUNICATIONS

3.1 Direct communications shall be maintained between the control room and personnel at the refueling station in containment.

APPLICABILITY: During CORE ALTERATIONS.

ACTION:

When direct communications between the control room and personnel at the refueling station cannot be maintained, suspend all CORE ALTERATIONS.

4.0 SURVEILLANCE REQUIREMENTS:

4.1 Direct communications between the control room and personnel at the refueling station in containment shall be demonstrated within 1 hour prior to the start of and at least once per 12 hours during CORE ALTERATIONS.

5.0 OPERATIONAL REQUIREMENTS - REFUELING MACHINE

5.1 The refueling machine and auxiliary hoist shall be used for movement of drive rods or fuel assemblies and shall be OPERABLE with:

a. The refueling machine, used for movement of fuel assemblies, having:

1. A minimum capacity of 4000 pounds, and
2. An automatic overload cutoff limit less than or equal to 2700 pounds.

b. The auxiliary hoist, used for latching and unlatching drive rods, having:

1. A minimum capacity of 3000 pounds, and
2. A 0 - 2000 pound digital load indicator that shall be used to monitor loads to prevent lifting more than 600 pounds.

APPLICABILITY: During movement of drive rods or fuel assemblies within the reactor vessel.

ACTION:

With the requirements for the refueling machine and/or auxiliary hoist OPERABILITY not satisfied, suspend use of any inoperable refueling machine and/or auxiliary hoist from operations involving the movement of drive rods and fuel assemblies within the reactor vessel.

6.0 SURVEILLANCE REQUIREMENTS

6.1 The refueling machine used for movement of fuel assemblies within the reactor vessel shall be demonstrated OPERABLE, within 100 hours prior to the start of such operations, by performing a load test of at least 4000 pounds and demonstrating an automatic load cutoff at less than or equal to 2700 pounds.

Refueling Operations

6.0 SURVEILLANCE REQUIREMENTS (continued)

- 6.2 The auxiliary hoist and associated load indicator used for movement of drive rods within the reactor vessel shall be demonstrated OPERABLE within 100 hours prior to the start of such operations by performing a load test of at least 900 pounds.

7.0 OPERATIONAL REQUIREMENTS - CRANE TRAVEL / FUEL HANDLING BUILDING

- 7.1 Loads in excess of 2300 pounds shall be prohibited from travel over fuel assemblies in the storage pool.

APPLICABILITY: With irradiated fuel assemblies in the storage pool.

ACTION:

With the requirements of the above specification not satisfied, place the crane load in a safe condition.

8.0 SURVEILLANCE REQUIREMENTS

- 8.1 Crane interlocks and physical stops which prevent crane travel with loads in excess of 2300 pounds over fuel assemblies shall be demonstrated OPERABLE within 7 days prior to crane use and at least once per 7 days thereafter during crane operation.

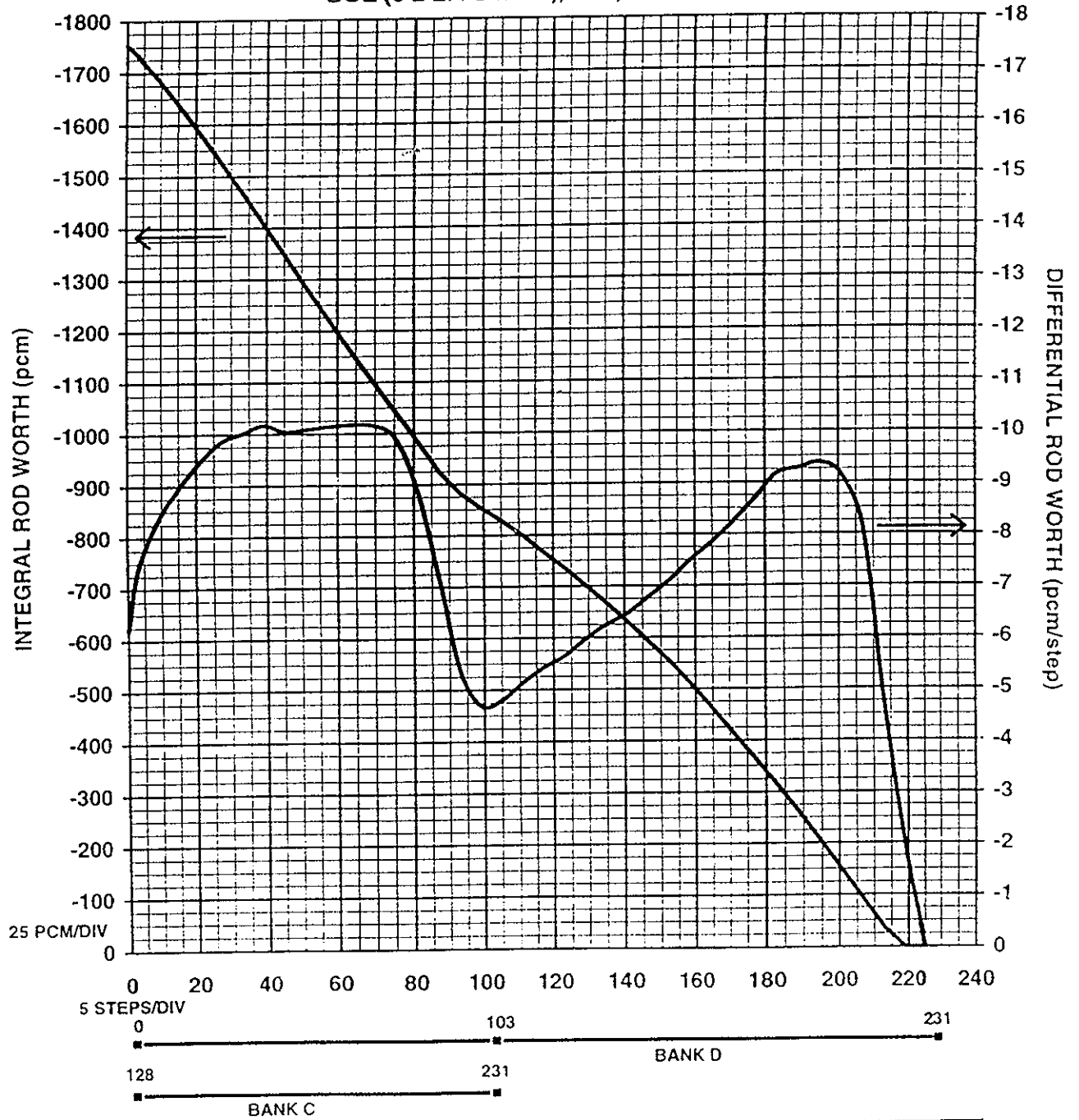
9.0 OPERATIONAL REQUIREMENTS

- 9.1 Spent Fuel Pool loads used for plant operations scenarios assume that the refueling outage duration (reactor shutdown to re-synchronization) is no shorter than 20 days.

10.0 SURVEILLANCE REQUIREMENTS

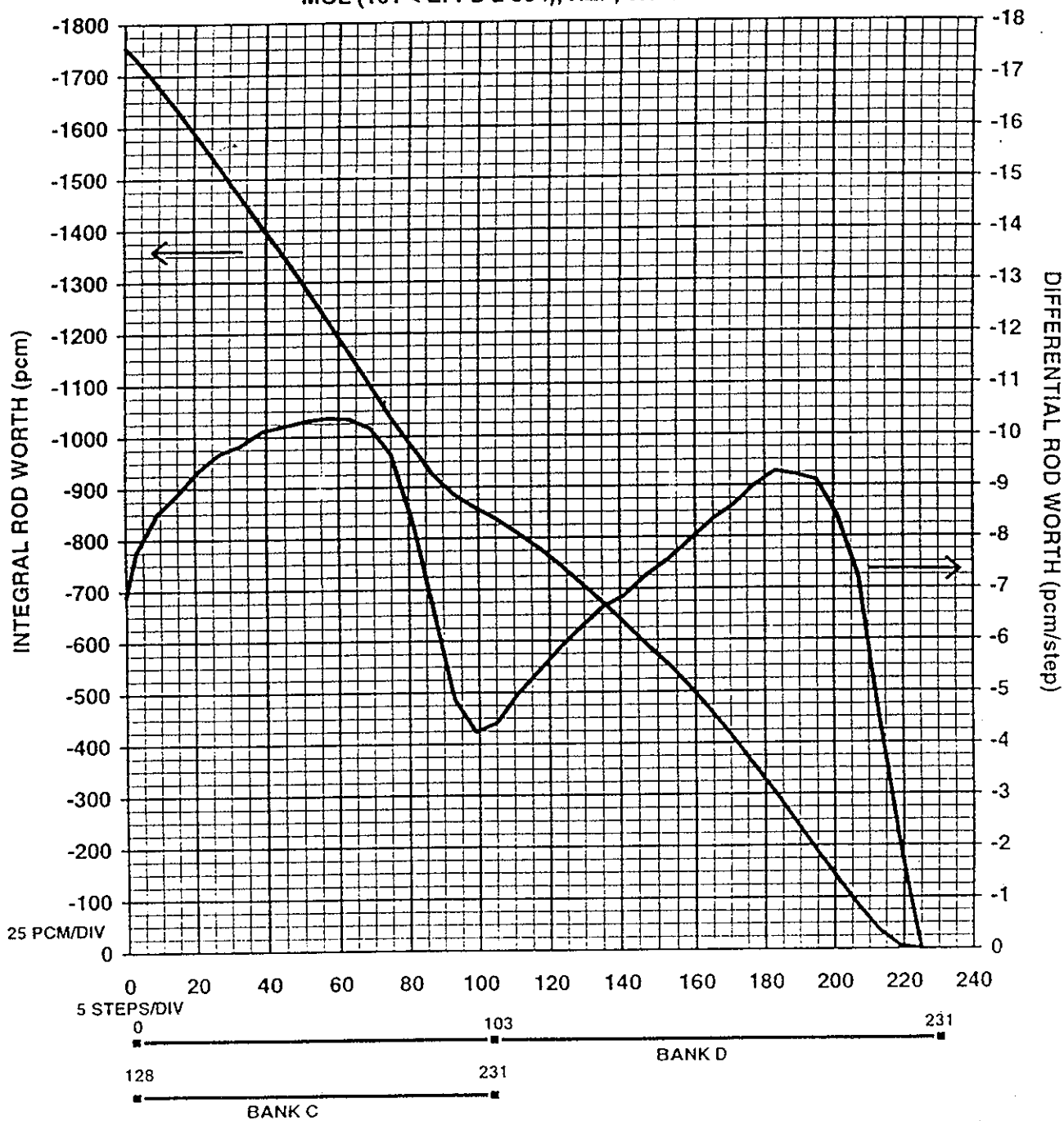
- 10.1 Prior to Entry into MODE 1 following a refueling outage, it must be confirmed that the duration of a refueling outage is greater than 20 days.

**HARRIS UNIT 1 CYCLE 11
DIFFERENTIAL AND INTEGRAL
ROD WORTH CONTROL BANKS D and C
MOVING WITH 103 STEP OVERLAP
BOL ($0 \leq \text{EFPD} \leq 161$), HZP, WITH NO XENON**



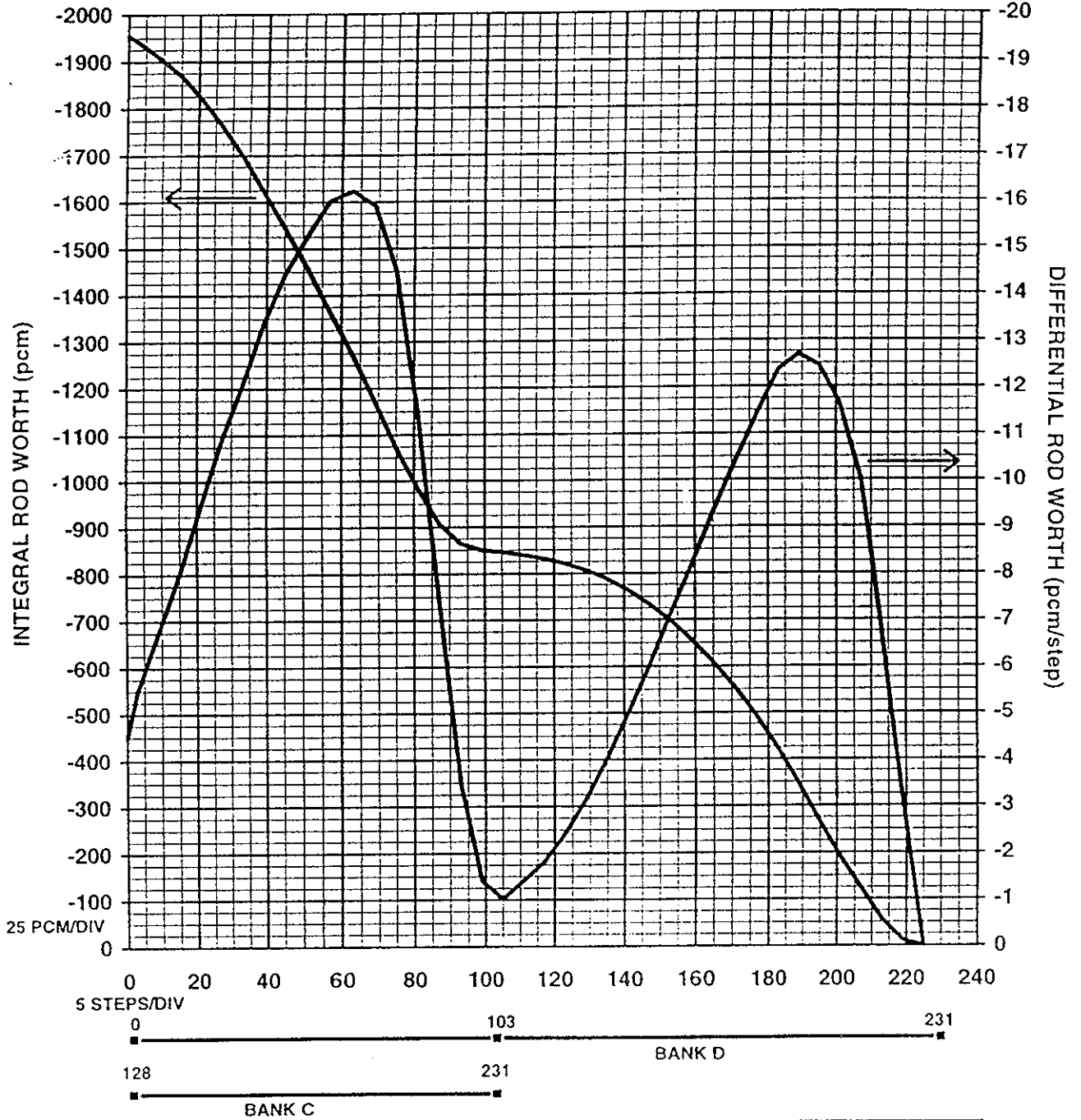
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ORIGINATOR	<i>Andrew E. Grogan - A-11-6</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/29/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

HARRIS UNIT 1 CYCLE 11
DIFFERENTIAL AND INTEGRAL
ROD WORTH CONTROL BANKS D and C
MOVING WITH 103 STEP OVERLAP
 MOL (161 < EFPD ≤ 334), HZP, WITH NO XENON



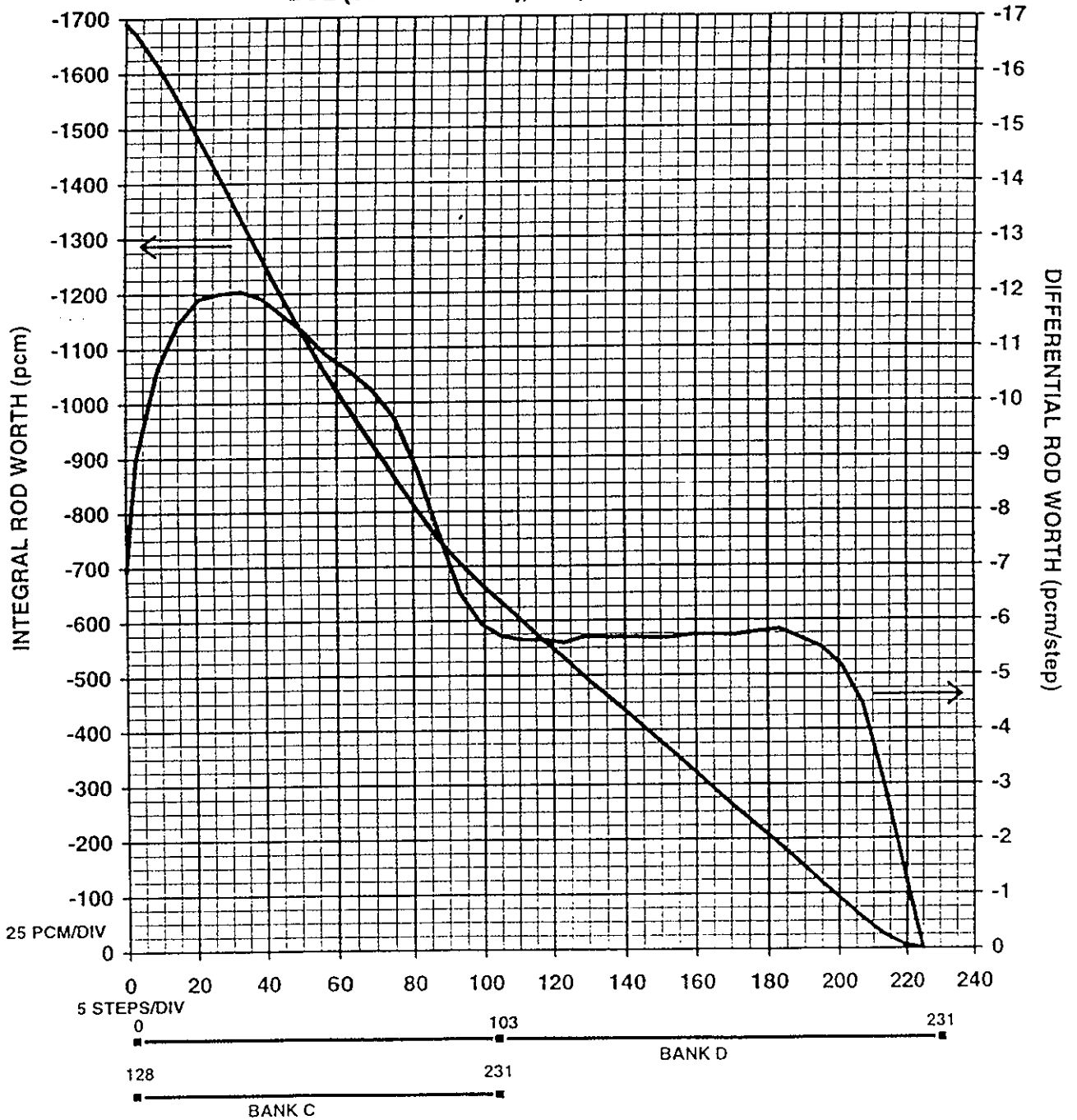
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ORIGINATOR	<i>Andrew E. Connors</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	12-29-01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10-31-01

HARRIS UNIT 1 CYCLE 11
DIFFERENTIAL AND INTEGRAL
ROD WORTH CONTROL BANKS D and C
MOVING WITH 103 STEP OVERLAP
 EOL (334 < EFPD ≤ 507), HZP, WITH NO XENON



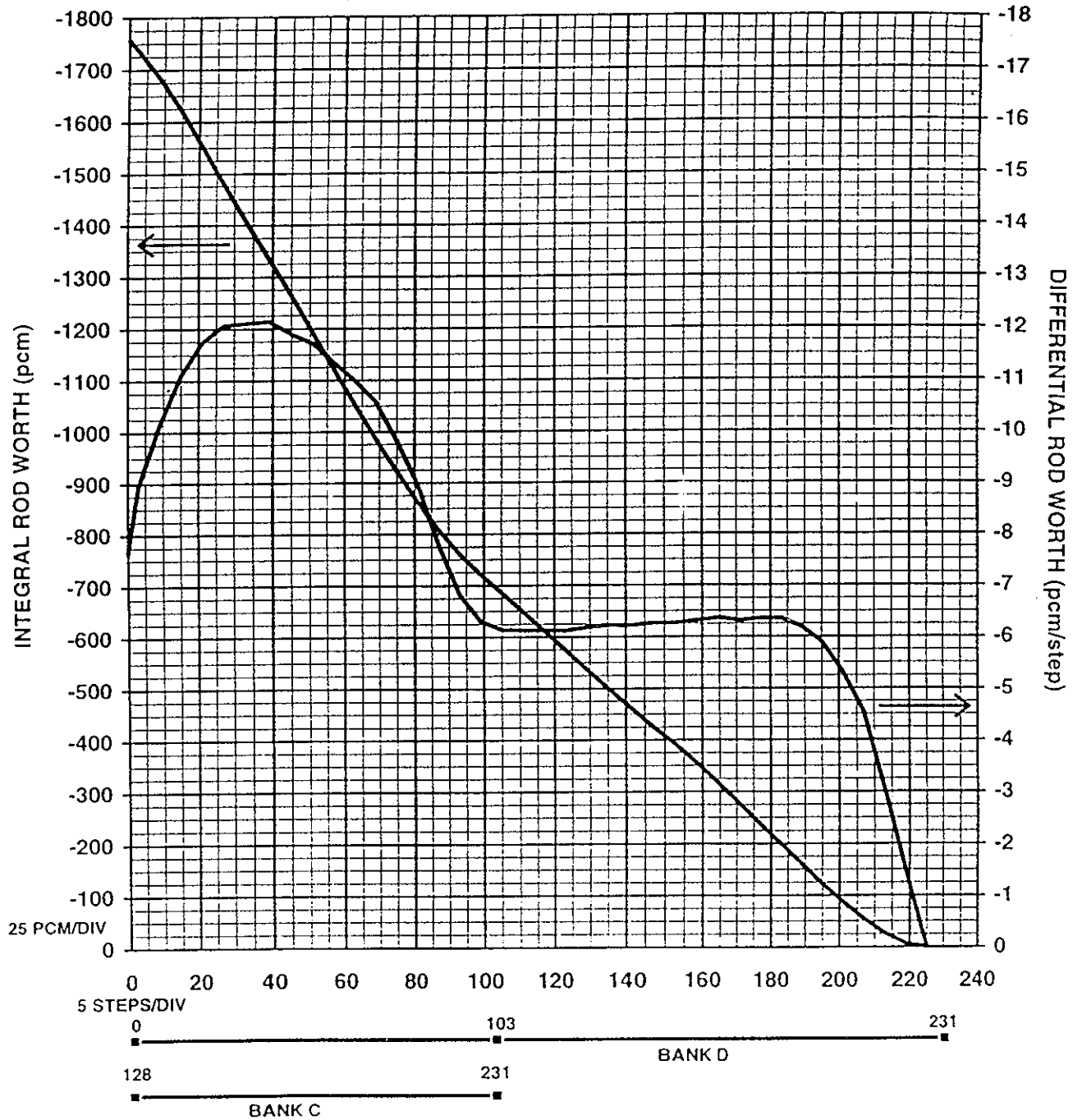
CURVE NO.	A-11-8	REV NO.	0
ORIGINATOR	<i>Andrea E. Carr-Mind</i>	DATE	<i>10/25/01</i>
SUPERVISOR	<i>[Signature]</i>	DATE	<i>10/23/01</i>
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	<i>10/31/01</i>

HARRIS UNIT 1 CYCLE 11
DIFFERENTIAL AND INTEGRAL
ROD WORTH CONTROL BANKS D and C
MOVING WITH 103 STEP OVERLAP
 BOL ($0 \leq \text{EFPD} \leq 161$), HFP, EQUILIBRIUM XENON



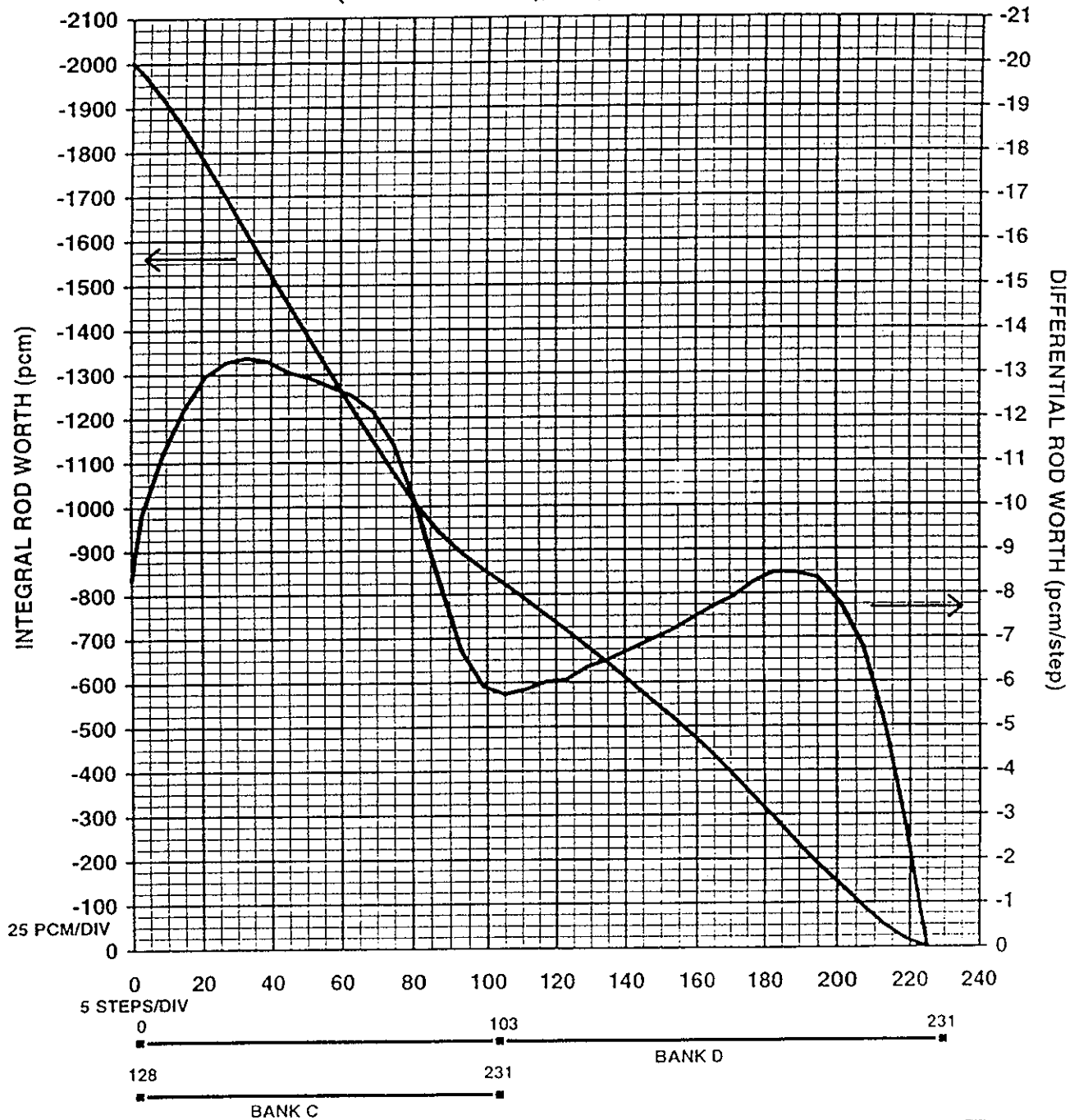
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ORIGINATOR	<i>Caroline E. Cross-Neil</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/28/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

HARRIS UNIT 1 CYCLE 11
DIFFERENTIAL AND INTEGRAL
ROD WORTH CONTROL BANKS D and C
MOVING WITH 103 STEP OVERLAP
 MOL (161 < EFPD ≤ 334), HFP, EQUILIBRIUM XENON



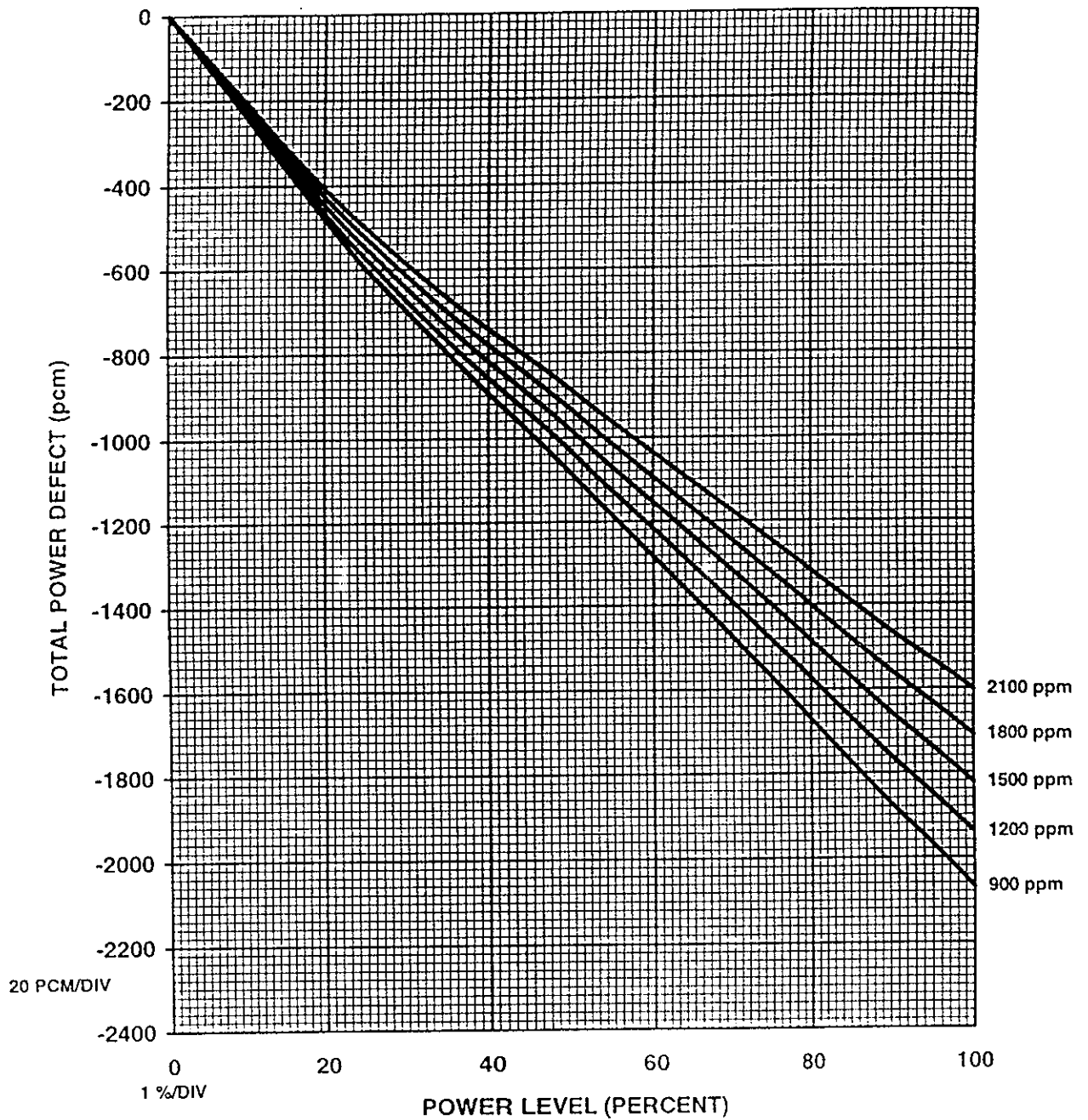
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ORIGINATOR	<i>Cynthia E. Cross-Ning</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	12/22/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

HARRIS UNIT 1 CYCLE 11
DIFFERENTIAL AND INTEGRAL
ROD WORTH CONTROL BANKS D and C
MOVING WITH 103 STEP OVERLAP
 EOL (334 < EFPD ≤ 507), HFP, EQUILIBRIUM XENON



CURVE NO.	A-11-11	REV NO.	0
ORIGINATOR	<i>Andrea E. Cron - Nil</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/29/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

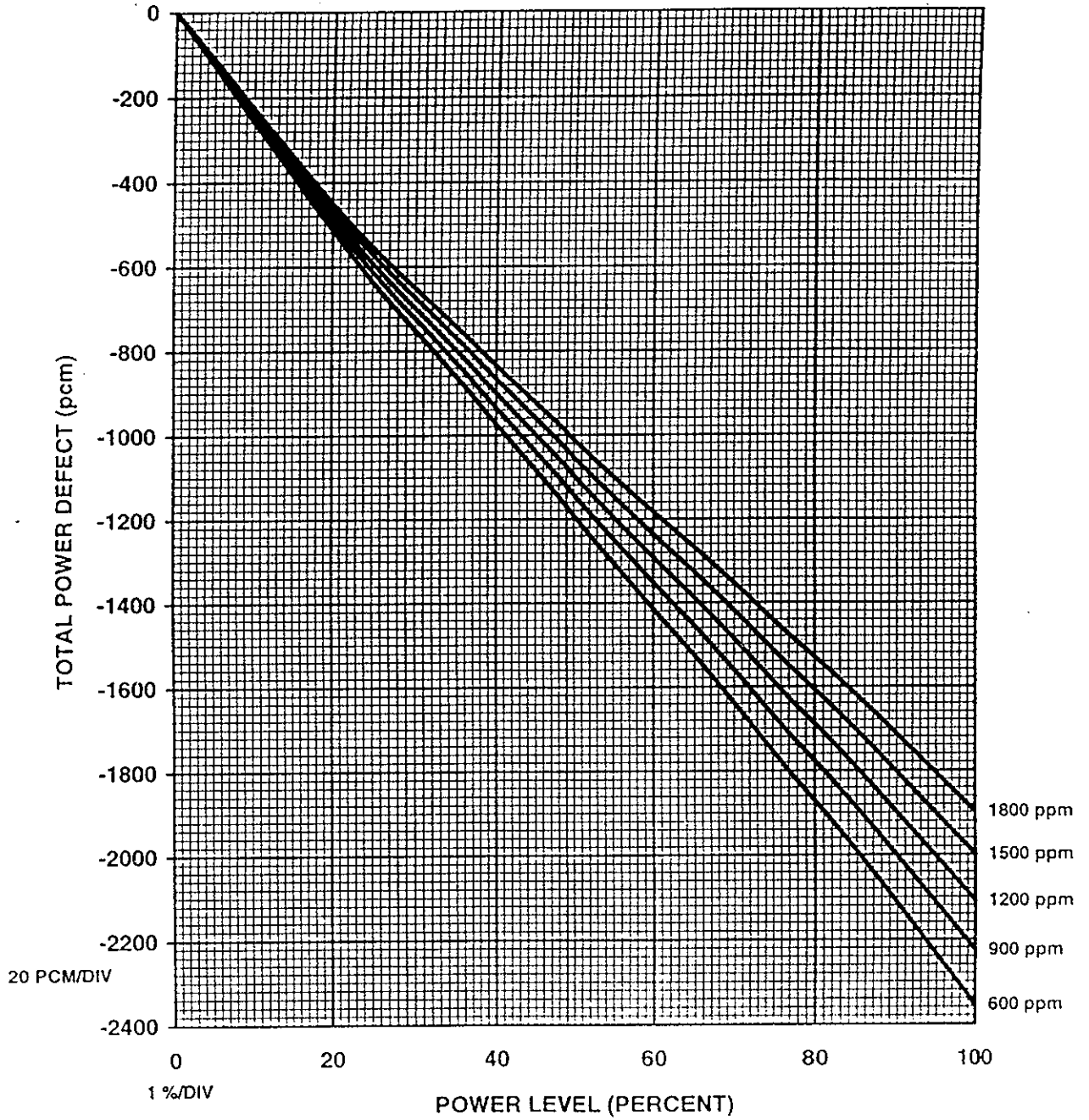
HARRIS UNIT 1 CYCLE 11
POWER DEFECT vs. POWER LEVEL
for VARIOUS BORON CONCENTRATIONS
BOL ($0 \leq \text{EFPD} \leq 161$)



CURVE NO.	C-11-1	REV NO.	0
ORIGINATOR	<i>Andrew E. Cowy-Mind</i>	DATE	<i>10/25/01</i>
SUPERVISOR	<i>[Signature]</i>	DATE	<i>10/29/01</i>
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	<i>10/31/01</i>

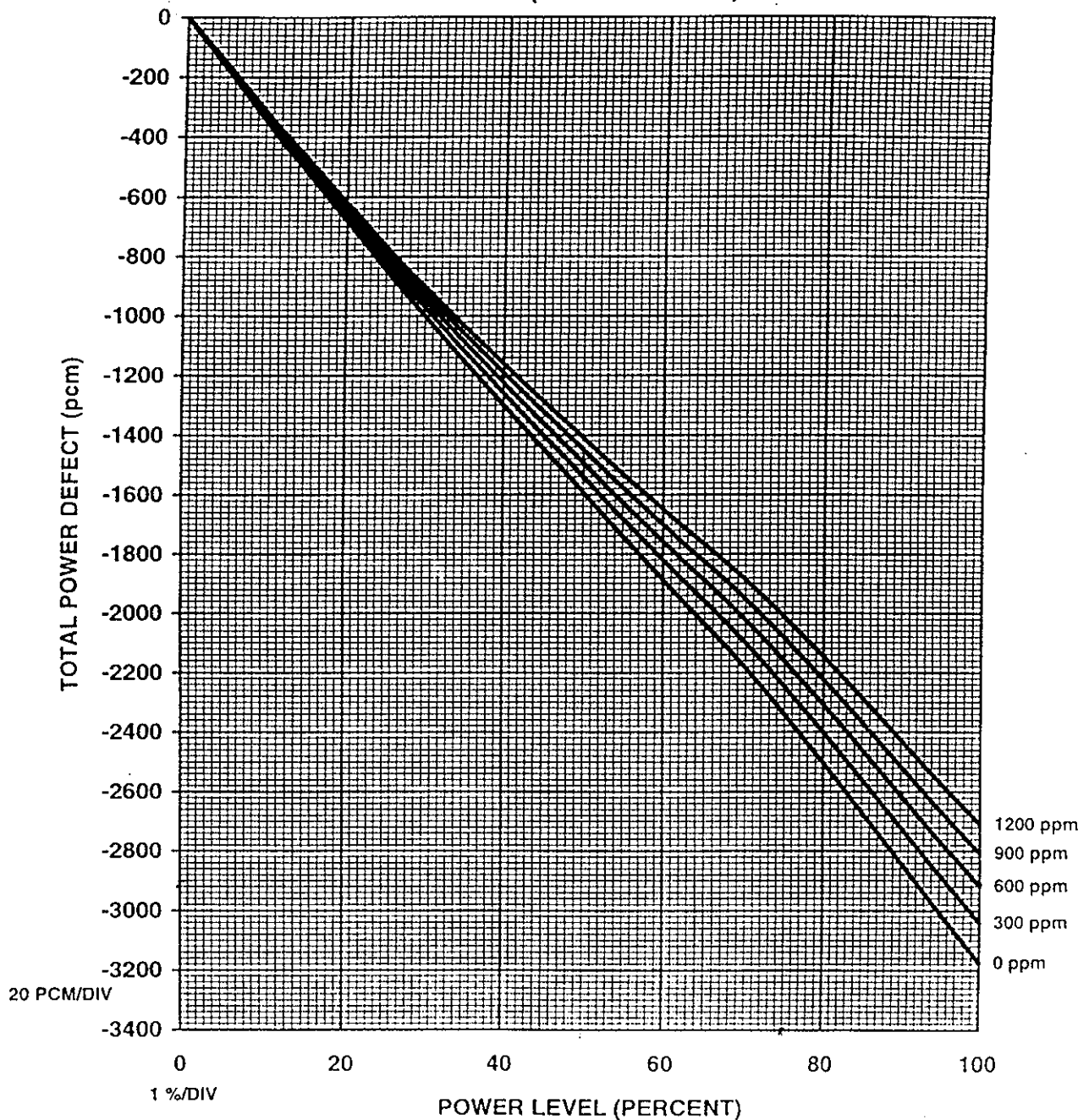
HARRIS UNIT 1 CYCLE 11
POWER DEFECT vs. POWER LEVEL
for VARIOUS BORON CONCENTRATIONS

MOL (161 < EFPD ≤ 334)



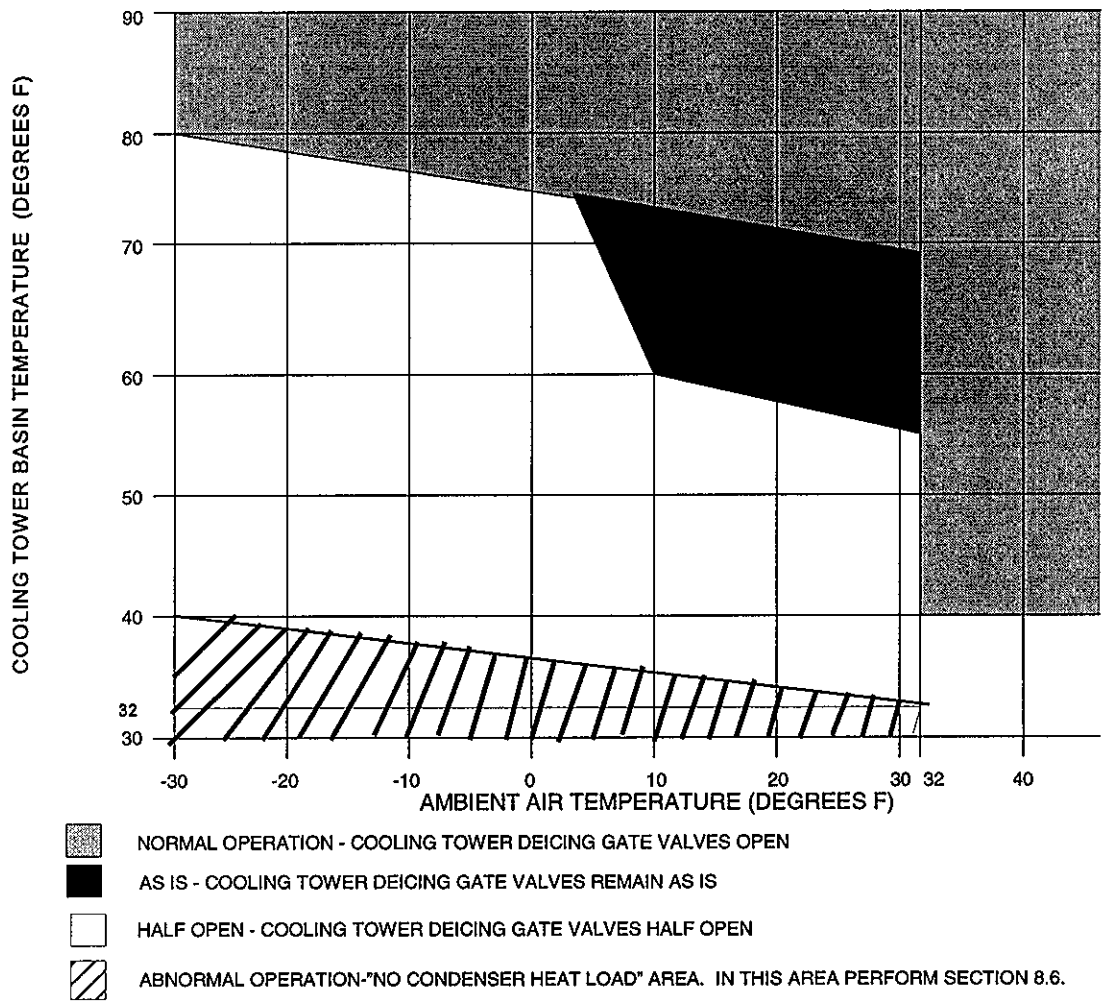
CURVE NO.	C-11-2	REV NO.	0
ORIGINATOR	<i>Andrew E. Goss-Mind</i>	DATE	<i>10/25/01</i>
SUPERVISOR	<i>[Signature]</i>	DATE	<i>10/29/01</i>
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	<i>10/31/01</i>

HARRIS UNIT 1 CYCLE 11
POWER DEFECT vs. POWER LEVEL
for VARIOUS BORON CONCENTRATIONS
EOL ($334 < \text{EFPD} \leq 507$)



CURVE NO.	C-11-3	REV NO.	0
ORIGINATOR	<i>Andrew E. Gray-Mead</i>	DATE	<i>10/25/01</i>
SUPERVISOR	<i>[Signature]</i>	DATE	<i>10/27/01</i>
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	<i>10/31/01</i>

Cooling Tower Cold Weather Operation



*Replacement provided for
previous page.*