

Final Submittal

(Blue Paper)

1. Reactor 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 D55K3.01

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

K/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 025 AK 2.05

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

K/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 013 K6.01

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 0622.127

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?

- Step in at 8 steps per minute to reduce Tavg to 553°F
- Step in at 8 steps per minute to reduce Tavg to 557°F
- Step in at 72 steps per minute to reduce Tavg to 553°F
- Step in at 72 steps per minute to reduce Tavg to 557°F

ANSWER:

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

K/A DD1K5.42

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

H/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 063 K2.01

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?

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

ANSWER:

- b. 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?

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

ANSWER:

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

K/A 015/017AA1.08

**Harris Nuclear Plant
August 2002 – RO 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:

CNMT FAN HIGH AH-2A	CNMT FAN HIGH AH-2B	CNMT FAN LOW AH-2A	CNMT FAN LOW AH-2B	SW BSTR PUMP START A
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?

	CNMT FAN HIGH AH-2A	CNMT FAN HIGH AH-2B	CNMT FAN LOW AH-2A	CNMT FAN LOW AH-2B	SW BSTR PUMP START A
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 040AA1.22

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 001AK1.16

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 0124.1.11

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 6.2.4.7

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.D8

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'

K/A 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 045A1.06

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.

NA

W/ED9EK1.02

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 056 A A2.22

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 D17A3.01

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/ED8EK2.02

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 DHEA1.01

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 035A3.01

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 006A4.08

QUESTION: 75

Given the following conditions:

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

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

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

ANSWER:

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

K/A D29EK3.12

QUESTION: 76

Given the following conditions:

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

Which one of the following describes the required radiological postings?

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

ANSWER:

- c. High Radiation Area with a red flashing light

K/A G. 2.3.2

QUESTION: 77

Given the following conditions:

- A makeup to the PRT is in progress per OP-100, "Reactor Coolant System."
- Both 1RC-161, RMW TO CNMT, and 1RC-167, RMW TO PRT, are open.

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

- a.
 - **ONLY** a Phase A signal
 - 1RC-161, RMW TO CNMT, closes
 - 1RC-167, RMW TO PRT, remains open
- b.
 - **ONLY** a Phase A signal
 - 1RC-161, RMW TO CNMT, remains open
 - 1RC-167, RMW TO PRT, closes
- c.
 - **EITHER** a Phase A signal **OR** a Phase B signal
 - 1RC-161, RMW TO CNMT, closes
 - 1RC-167, RMW TO PRT, remains open
- d.
 - **EITHER** a Phase A signal **OR** a Phase B signal
 - 1RC-161, RMW TO CNMT, remains open
 - 1RC-167, RMW TO PRT, closes

ANSWER:

- a.
 - **ONLY** a Phase A signal
 - 1RC-161, RMW TO CNMT, closes
 - 1RC-167, RMW TO PRT, remains open

K/A 007A4.01

QUESTION: 78

Given the following conditions:

- Emergency Boration is required.
- 1CS-278, Emergency Boric Acid Addition, is failed CLOSED.

Which of the following alignments will provide adequate boric acid flow?

	1CS-283 Boric Acid to Boric Acid Blender FCV-113A	1CS-156 Makeup to CSIP Suction FCV-113B	1CS-155 Makeup to VCT FCV-114A	1CS-291 CSIP Suction from RWST LCV-115B	1CS-292 CSIP Suction from RWST LCV-115D	1CS-165 VCT Outlet LCV-115C	1CS-166 VCT Outlet LCV-115E
a.	CLOSED	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	OPEN
b.	OPEN	CLOSED	OPEN	CLOSED	CLOSED	OPEN	CLOSED
c.	CLOSED	OPEN	CLOSED	CLOSED	CLOSED	OPEN	OPEN
d.	OPEN	CLOSED	CLOSED	OPEN	CLOSED	OPEN	CLOSED

ANSWER:

d.	OPEN	CLOSED	CLOSED	OPEN	CLOSED	OPEN	CLOSED
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K/A 024AK2.01

QUESTION: 79

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

If IR channel N-36 fails low ...

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

ANSWER:

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

HA 033 AK1.01

QUESTION: 80

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

- a.
 - Power level at 65%
 - No (0) Heater Drain Pumps operating
 - One (1) train of Feed Water Pumps (FWP, CBP, CP) operating

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

- c.
 - Power level at 92%
 - No (0) Heater Drain Pumps operating
 - Two (2) trains of Feed Water Pumps (FWP, CBP, CP) operating

- d.
 - Power level at 70%
 - One (1) Heater Drain Pump operating
 - One (1) train of Feed Water Pumps (FWP, CBP, CP) operating

ANSWER:

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

K/A 059A1.03

QUESTION: 81

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

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

ANSWER:

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

K/A 079A4.01

QUESTION: 82

Given the following conditions:

- PATH-2 is being performed in response to a tube rupture on SG 'C'.
- SI termination criteria is being checked.

Over the last several minutes:

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

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

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

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

ANSWER:

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

R/A G. 2.4.17

QUESTION: 83

Given the following conditions:

- A large break LOCA has occurred.
- Containment hydrogen concentration is 1.2%.
- Containment pressure is 6 psig.
- Electric Hydrogen Recombiner (EHR) 1A-SA was placed in service two (2) hours ago.

Which of the following describes the expected status of EHR 1B-SB and the Containment Hydrogen Purge System?

	<u>EHR 1B-SB</u>	<u>CONTAINMENT HYDROGEN PURGE</u>
a.	In Standby	Operating
b.	In Standby	Secured
c.	In Service	Operating
d.	In Service	Secured

ANSWER:

- | | | |
|----|------------|---------|
| b. | In Standby | Secured |
|----|------------|---------|

K/A 0282.1.32

QUESTION: 84

Given the following conditions:

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

Which of the following will automatically actuate to stabilize RCS temperature instead of Condenser Steam Dumps **AND** why does C-9 prevent Condenser Steam Dump operation?

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

ANSWER:

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

K/A 051AK3.01

QUESTION: 85

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

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

- b.
 - ALB-002-3-2, SW BSTR PUMP A AUTO START FAIL/OVERRIDE, in alarm
 - ALB-002-3-3, SW BSTR PUMP A O/C TRIP OR CLOSE CKT TROUBLE, in alarm
 - SI actuated

- c.
 - ALB-002-6-2, SERV WTR PUMPS DISCHARGE VLV NOT FULL OPEN, in alarm
 - NSW Pump 'A' has been started in Priming Mode
 - NSW Pump discharge valve 10% open

- d.
 - ALB-002-7-5, COMPUTER ALARM SERVICE WATER, in alarm
 - Main Reservoir temperature indicating 94°F
 - Aux Reservoir temperature indicating 88°F

ANSWER:

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

K/A 0762.4.10

QUESTION: 86

Given the following conditions:

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

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

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

ANSWER:

- c. 46%.

K/A G.2.2.12

QUESTION: 87

Given the following conditions:

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

Which of the following parameters would be the **LEAST AFFECTED** by this rod misalignment?

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

ANSWER:

- c. Axial Flux Difference indications

K/A 005AKI.02

QUESTION: 88

Given the following conditions:

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

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

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

ANSWER:

- d. placing this fuel assembly in the vessel.

K/A 036AA1.04

QUESTION: 89

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

Which of the following is the concern if ESW Booster pumps fail to start while high containment pressure conditions exist?

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

ANSWER:

- d. Radioactivity release to the environment

K/A

W/E 14EK3.02

QUESTION: 90

Given the following conditions:

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

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

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

ANSWER:

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

K/A 003K1.03

QUESTION: 91

Which of the following sets of conditions would **NOT** permit waiving the Independent Verification (IV) requirement for a clearance removal?

	<u>DOSE RATE</u>	<u>TIME TO PERFORM IV</u>	<u>AREA TEMPERATURE</u>
a.	120 mRem/hr	6 minutes	105°F
b.	180 mRem/hr	3 minutes	115°F
c.	90 mRem/hr	4 minutes	125°F
d.	60 mRem/hr	3 minutes	135°F

ANSWER:

b.	180 mRem/hr	3 minutes	115°F
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K/A G.2.1.29

QUESTION: 92

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

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

ANSWER:

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

K/A DD9EK3.20

QUESTION: 93

The unit is operating at 100% power.

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

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

ANSWER:

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

K/A DD1K2.02

QUESTION: 94

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

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

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

ANSWER:

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

K/A 060AA2.06

QUESTION: 95

Given the following conditions:

- The plant is at 22% power during a Technical Specification 3.0.3 required shutdown.
- Source Range Channel N-31 has been declared inoperable as a result of failing to meet Operational Test Criteria of MST-I0169.
- The LEVEL TRIP switch has been placed in the BYPASS position per OWP-RP-19, "Source Range N-31."
- The I&C Supervisor states that both control and instrument power must be removed from the N-31 drawer to replace a bistable module.

Should the control and instrument power fuses be removed **AND** why or why not?

- a. **NO**, because removing both fuses will cause the reactor to trip when the fuses are removed.
- b. **YES**, provided only the instrument power fuses are removed or the reactor will trip when power is reduced below P-10.
- c. **NO**, because removing both fuses will cause the reactor to trip when power is reduced below P-6.
- d. **YES**, because removing both fuses will **NOT** cause a reactor trip to occur.

ANSWER:

- c. **NO**, because removing both fuses will cause the reactor to trip when power is reduced below P-6.

K/A D15A4.03

QUESTION: 96

1CS-50, Letdown to VCT/Demin, automatically bypasses the CVCS Demineralizers when ...

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

ANSWER:

- b. TE-143, LP Letdown Temperature, exceeds 135°F to prevent damage to the demineralizer resin

K/A 004K4.16

QUESTION: 97

Given the following conditions:

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

If SG narrow range levels decrease to the following levels,

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

which of the following describes the expected AFW pump operation?

- a.
 - MDAFW Pump 1A-SA running
 - MDAFW Pump 1B-SB running
 - TDAFW Pump running
- b.
 - MDAFW Pump 1A-SA running
 - MDAFW Pump 1B-SB running
 - TDAFW Pump secured
- c.
 - MDAFW Pump 1A-SA secured
 - MDAFW Pump 1B-SB secured
 - TDAFW Pump running
- d.
 - MDAFW Pump 1A-SA secured
 - MDAFW Pump 1B-SB secured
 - TDAFW Pump secured

ANSWER:

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

K/A 061K2.02

QUESTION: 98

Given the following conditions:

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

Which of the following are the correct order of actions to be taken?

- a. Close the BIT valves, open the charging line isolation valves, and verify the normal miniflow isolation valves open
- b. Open the BIT valves, close the charging line isolation valves, and verify the normal miniflow isolation valves open
- c. Close the charging line isolation valves, open the BIT valves, and verify the normal miniflow isolation valves closed
- d. Open the charging line isolation valves, close the BIT valves, and verify the normal miniflow isolation valves closed

ANSWER:

- c. Close the charging line isolation valves, open the BIT valves, and verify the normal miniflow isolation valves closed

K/A W/EDGE A1.01

QUESTION: 99

In accordance with the EOP User's Guide, which of the following is an approved pre-emptive action?

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

ANSWER:

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

K/A G.2.1.20

QUESTION: 100

Given the following conditions:

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

Core cooling will be ...

- a. automatically re-established when the Emergency Diesel Generator output breaker closes.
- b. automatically re-established upon completion of the Sequencer loading.
- c. lost until the operator re-opens the RHR suction valves after the Emergency Diesel Generator output breaker closes.
- d. lost until the operator restarts the RHR pumps after the Emergency Diesel Generator output breaker closes.

ANSWER:

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

K/A 013A2.01

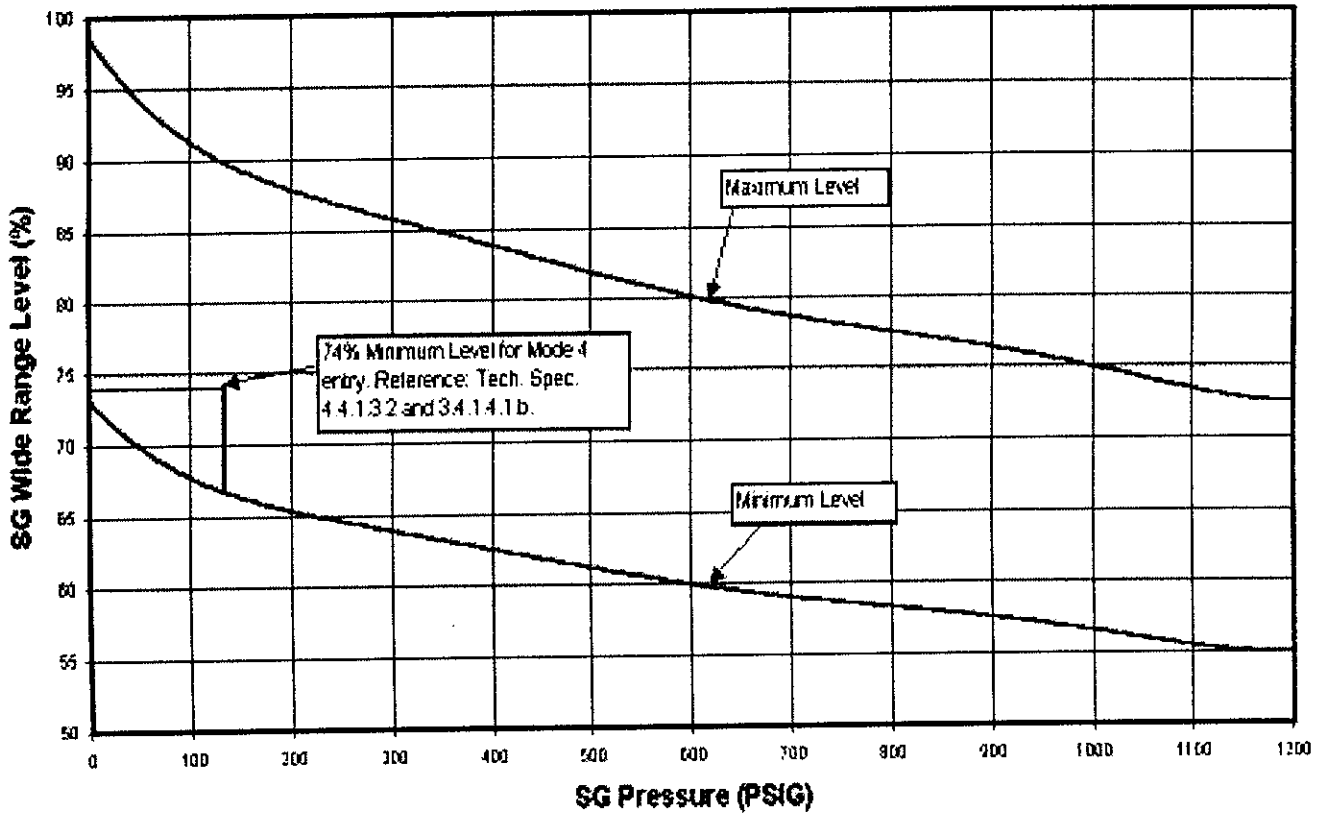
RO SUPPLIED REFERENCES

AOP-036, Attachment 6	SG Wide Range Level vs. SG Pressure
OP-107, Attachment 19	Makeup Concentration Limits
OP-141, Attachment 5	Cooling Tower Cold Weather Operation
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 -

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 = 120gpm

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 = 90gpm

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 = 70gpm

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 = 60gpm

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.

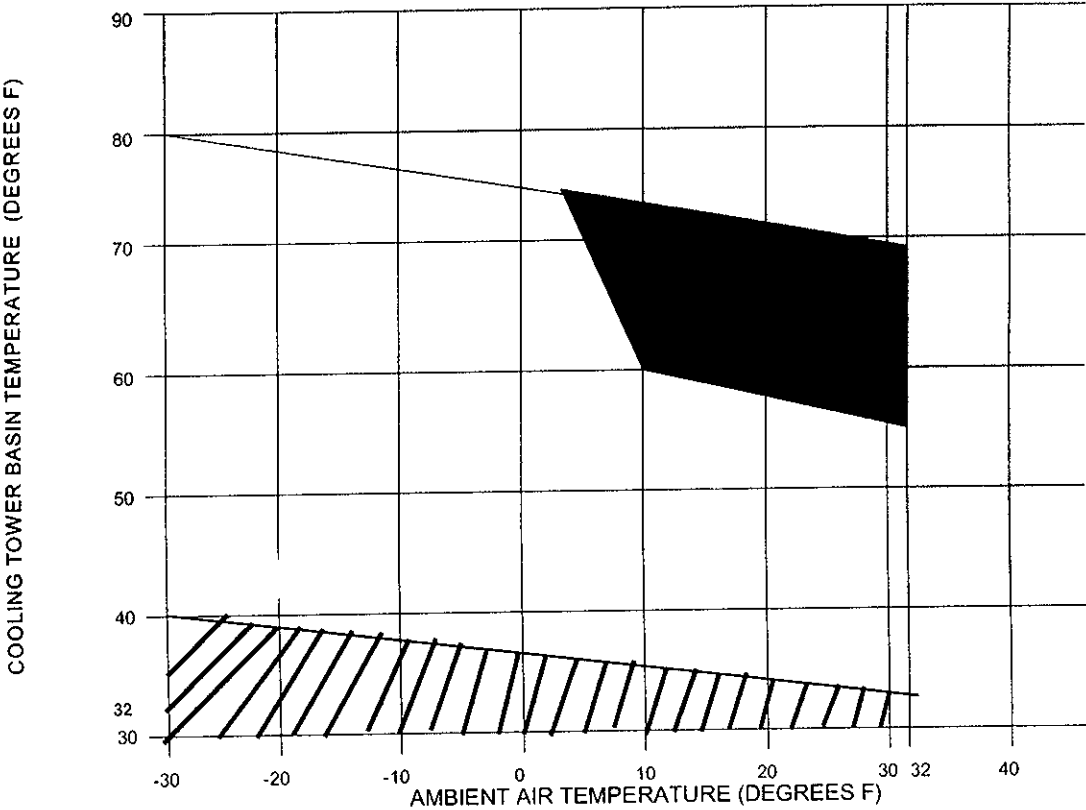
BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 60 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 60 GPM MAKEUP (1 GPM BA FLOW)
7000	3500	117
7050	3525	118
7100	3550	119
7150	3575	120
7200	3600	120
7250	3625	121
7300	3650	122
7350	3675	123
7400	3700	124
7450	3725	125
7500	3750	125
7550	3775	126
7600	3800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




Makeup Concentration Limits for: RWMU Total Makeup Flow Rate Q = 50gpm

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.

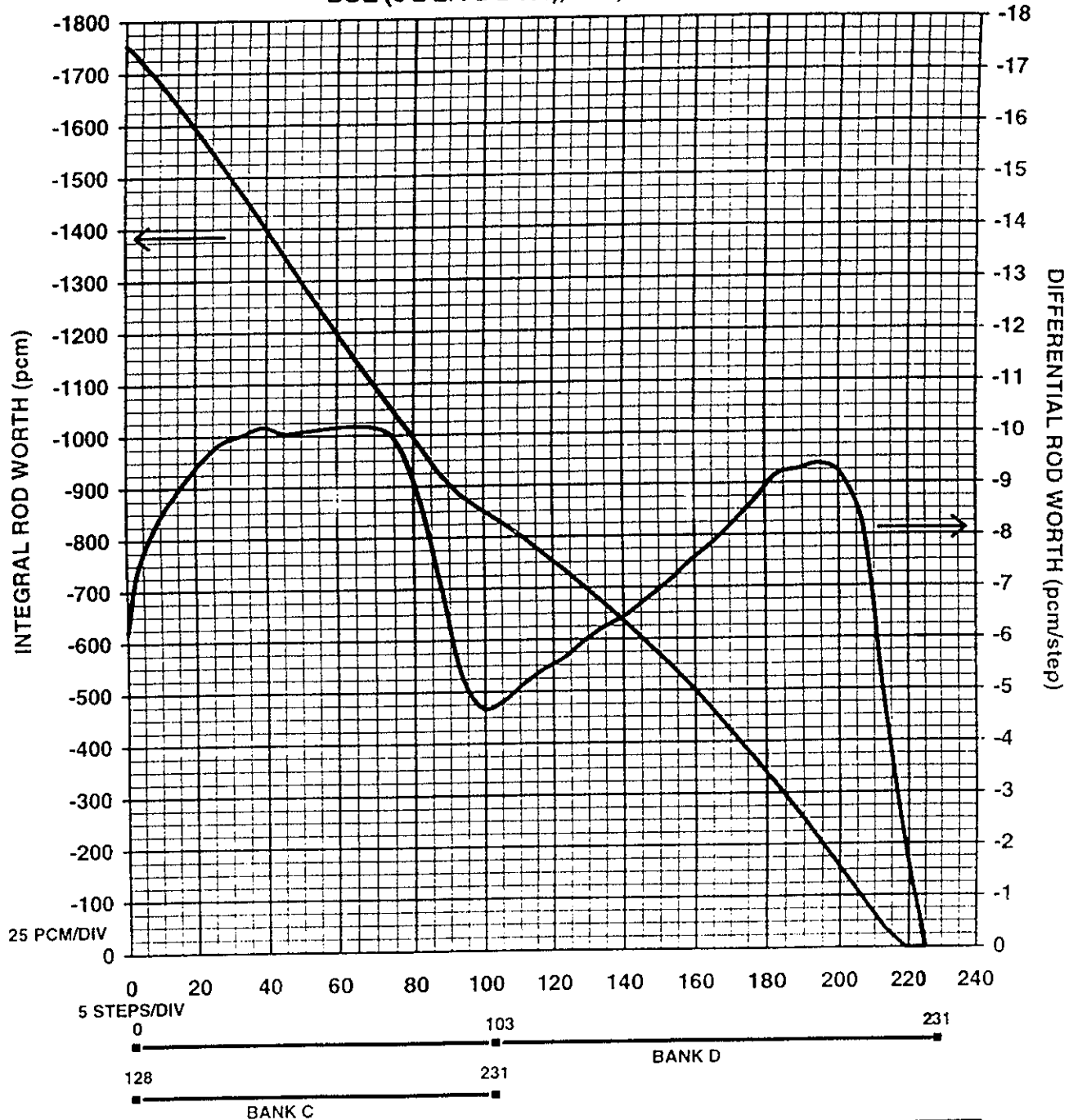
BAT BORON CONCENTRATION (PPM)	MAXIMUM PPM FOR 50 GPM MAKEUP (30 GPM BA FLOW)	MINIMUM PPM FOR 50 GPM MAKEUP (1 GPM BA FLOW)
7000	4200	140
7050	4230	141
7100	4260	142
7150	4290	143
7200	4320	144
7250	4350	145
7300	4380	146
7350	4410	147
7400	4440	148
7450	4470	149
7500	4500	150
7550	4530	151
7600	4560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

Cooling Tower Cold Weather Operation



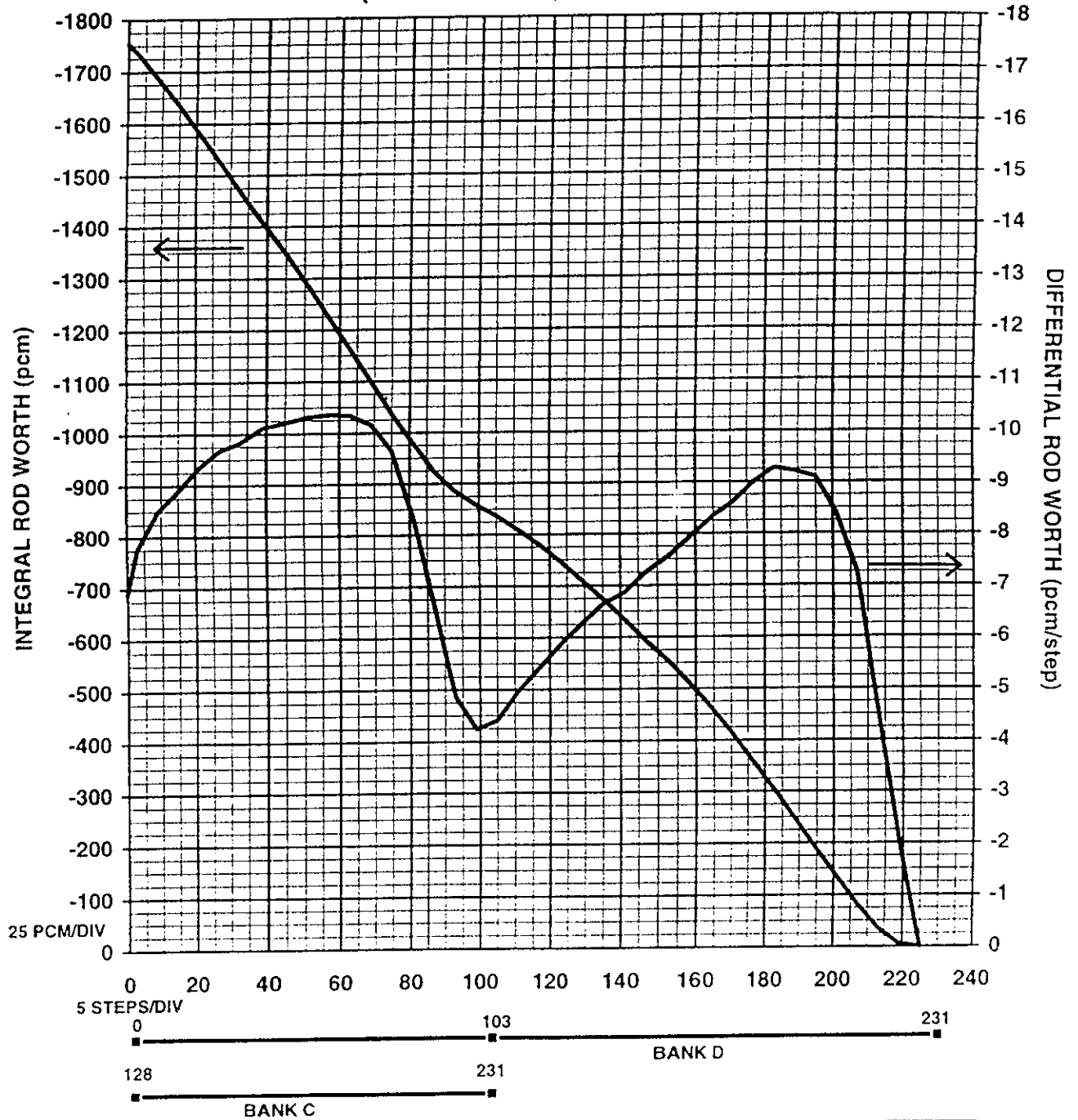
- NORMAL OPERATION - COOLING TOWER DEICING GATE VALVES OPEN
-  AS IS - COOLING TOWER DEICING GATE VALVES REMAIN AS IS
-  HALF OPEN - COOLING TOWER DEICING GATE VALVES HALF OPEN
-  ABNORMAL OPERATION- "NO CONDENSER HEAT LOAD" AREA. IN THIS AREA PERFORM SECTION 8.6.

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



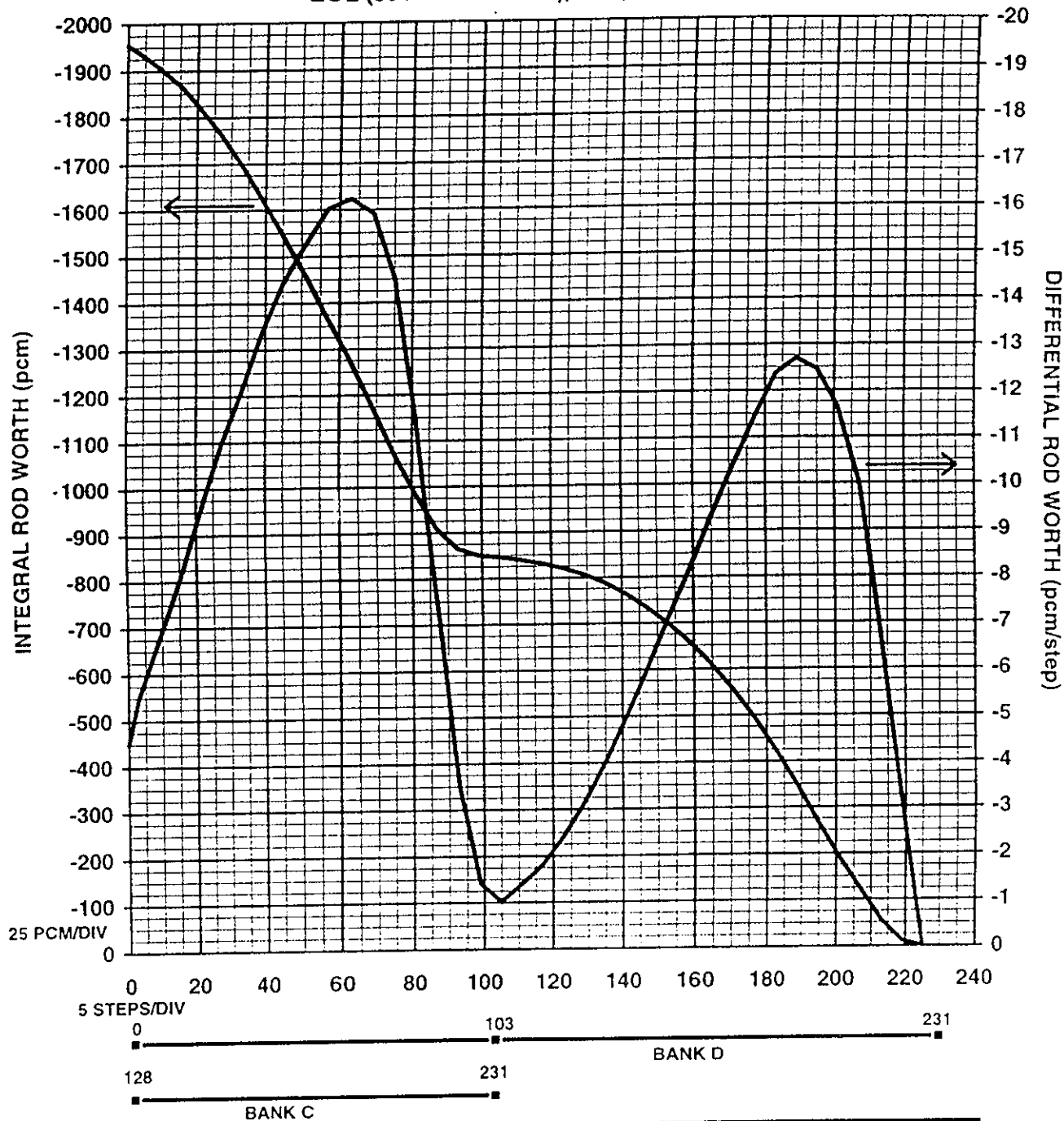
CURVE NO.	A-11-6	REV NO.	0
ORIGINATOR	<u>Andrew E. Cross - Neal</u>	DATE	<u>10/25/01</u>
SUPERVISOR	<u>[Signature]</u>	DATE	<u>10/29/01</u>
SUPERINTENDENT - SHIFT OPERATIONS	<u>[Signature]</u>	DATE	<u>10/31/01</u>

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



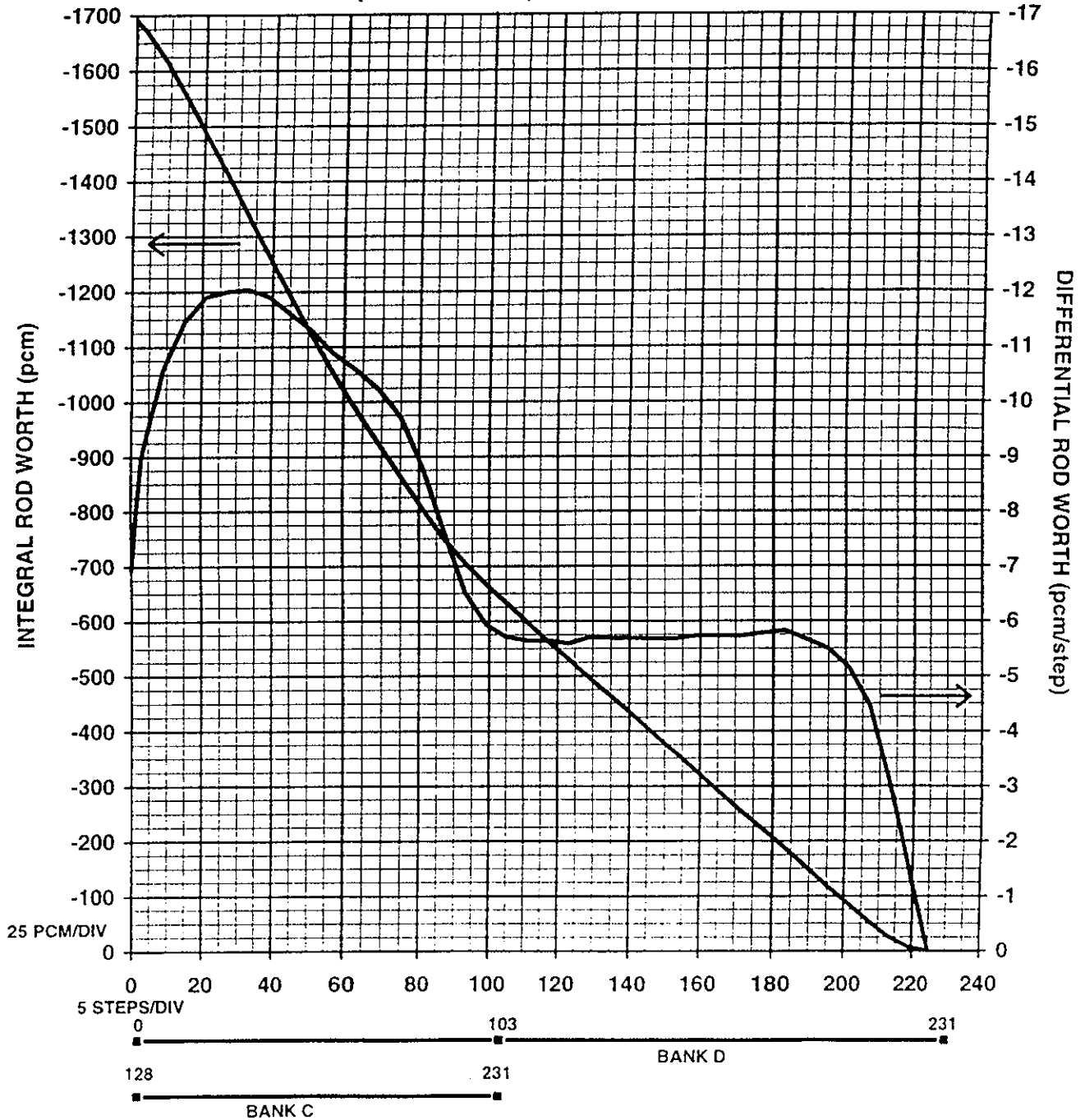
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ORIGINATOR	<i>Andrew F. Long - Chief</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10-29-01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10-31-01

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



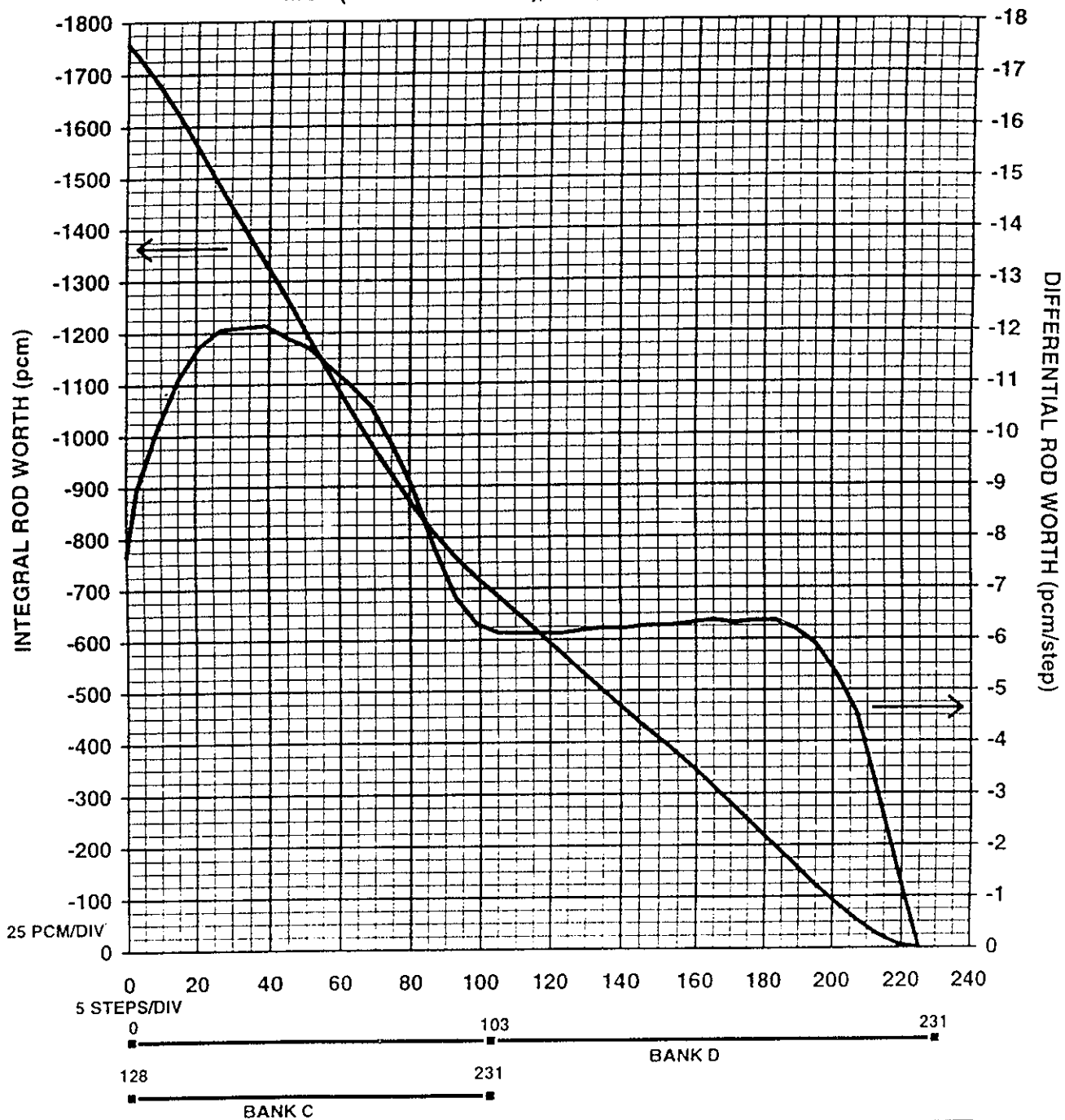
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ORIGINATOR	<i>Andrea E. Conn. Niel</i>	DATE	<i>10/25/01</i>
SUPERVISOR	<i>[Signature]</i>	DATE	<i>12/22/01</i>
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	<i>10/31/01</i>

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



CURVE NO.	A-11-9	REV NO.	0
ORIGINATOR	<i>Camden E. Cross - Niel</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/29/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

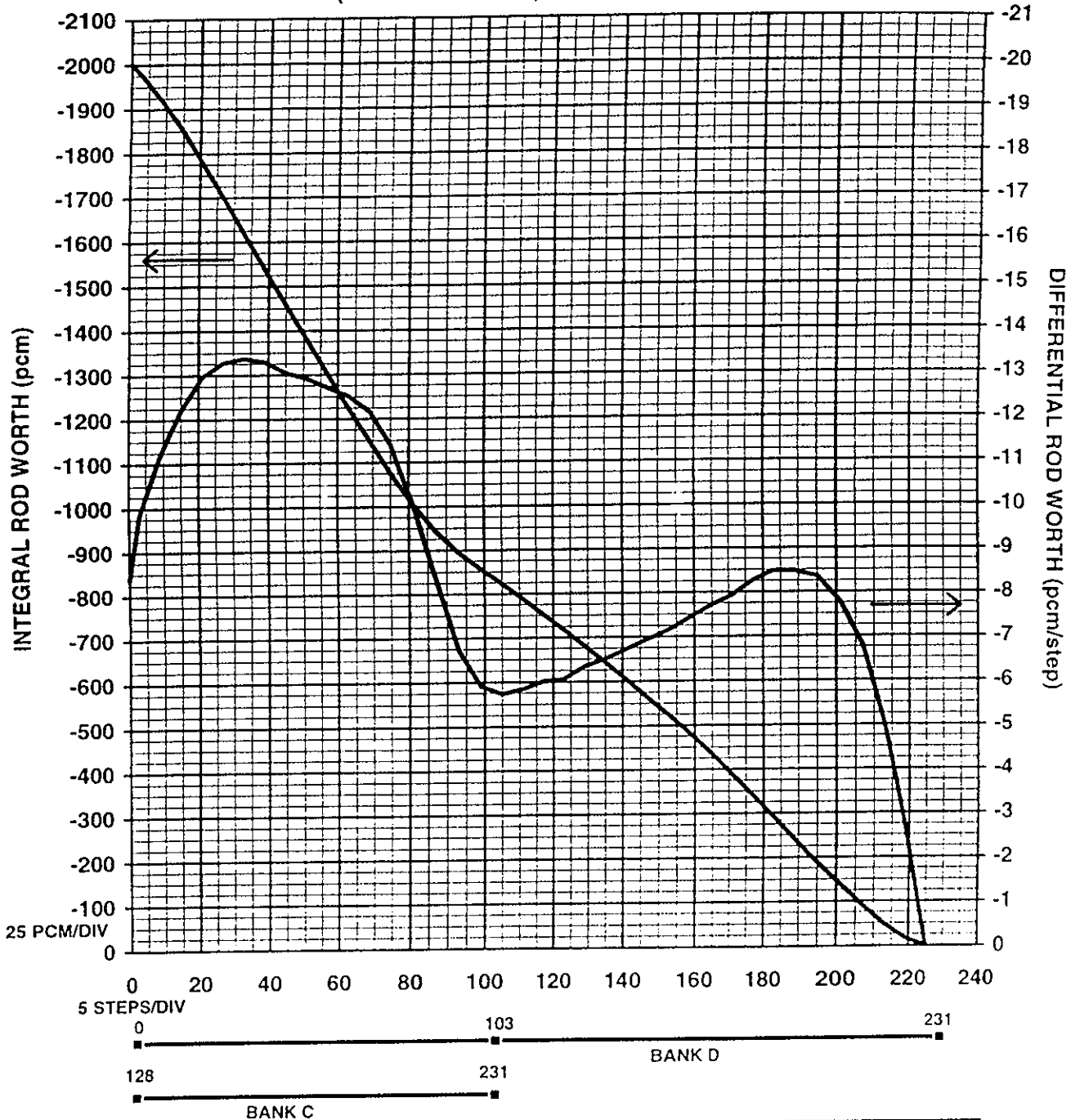
HARRIS UNIT 1 CYCLE 11
DIFFERENTIAL AND INTEGRAL
ROD WORTH CONTROL BANKS D and C
MOVING WITH 103 STEP OVERLAP
MOL (161 < EFPD ≤ 334), HFP, EQUILIBRIUM XENON



CURVE NO.	A-11-10	REV NO.	0
ORIGINATOR	<i>Andrew E. Corp. Nind</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/28/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

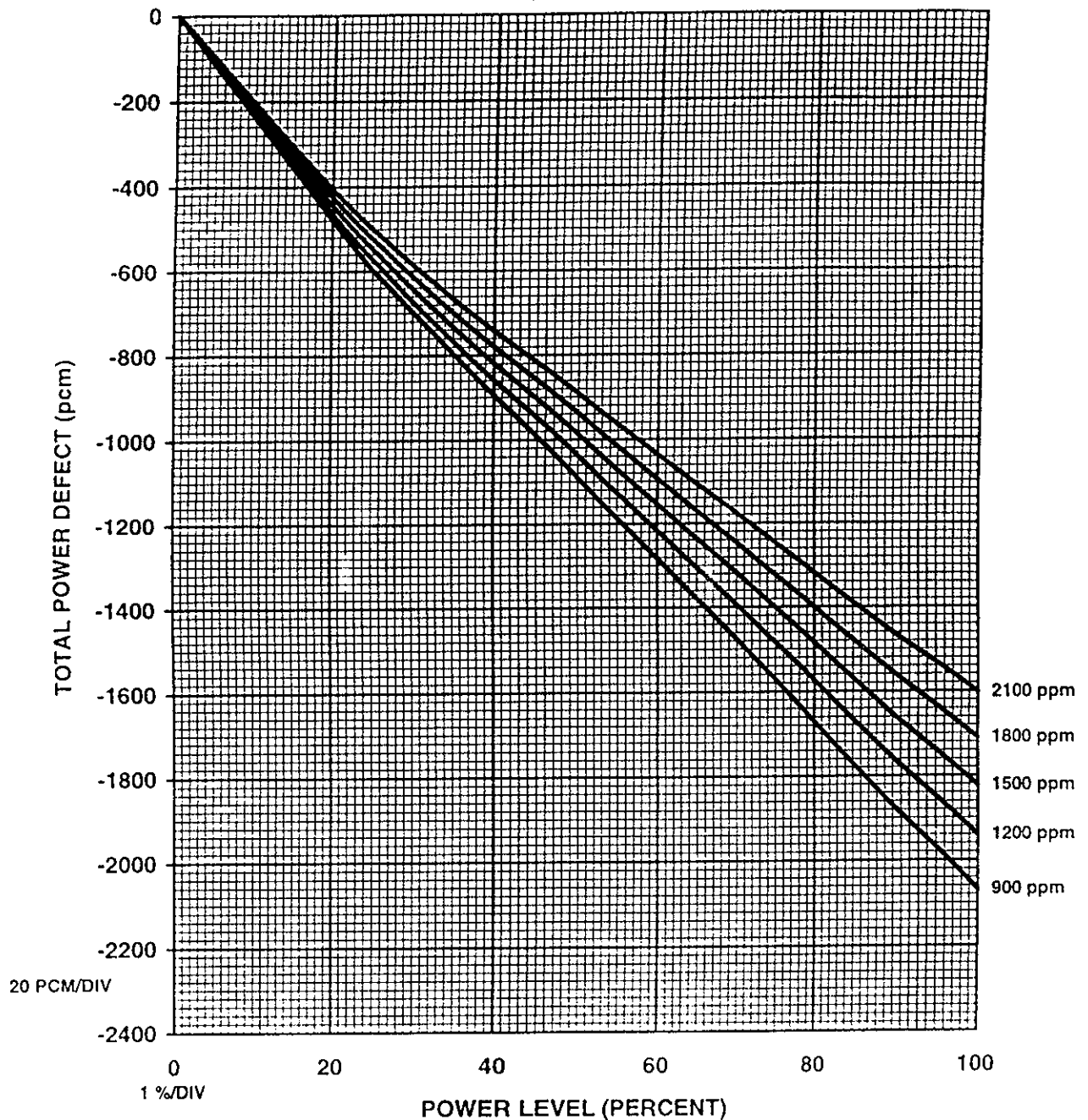
HARRIS UNIT 1 CYCLE 11 DIFFERENTIAL AND INTEGRAL ROD WORTH CONTROL BANKS D and C MOVING WITH 103 STEP OVERLAP

EOL (334 < EFPD ≤ 507), HFP, EQUILIBRIUM XENON



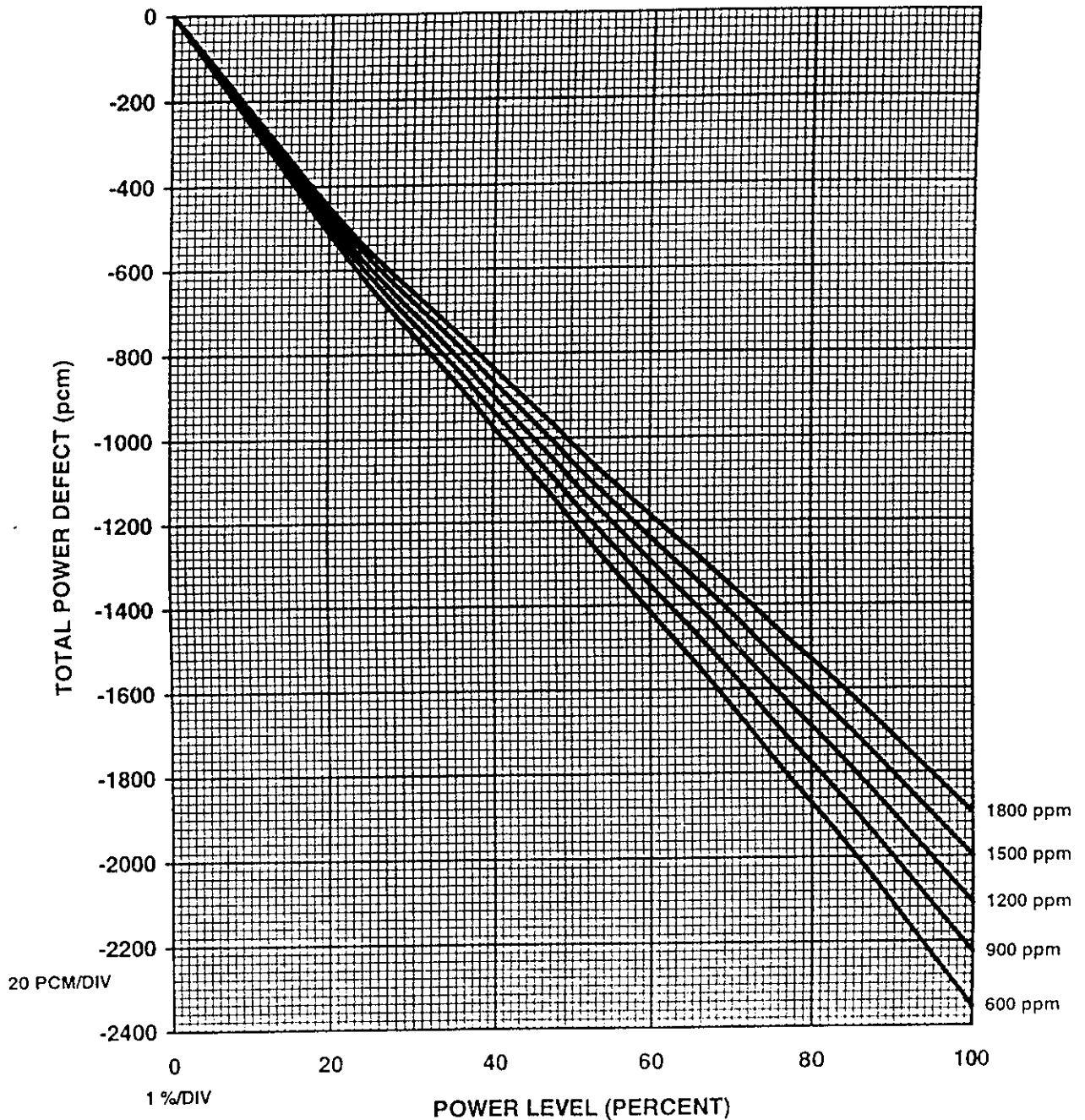
CURVE NO.	A-11-11	REV NO.	0
ORIGINATOR	<i>Andrea E. Ginn - NMI</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/29/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

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



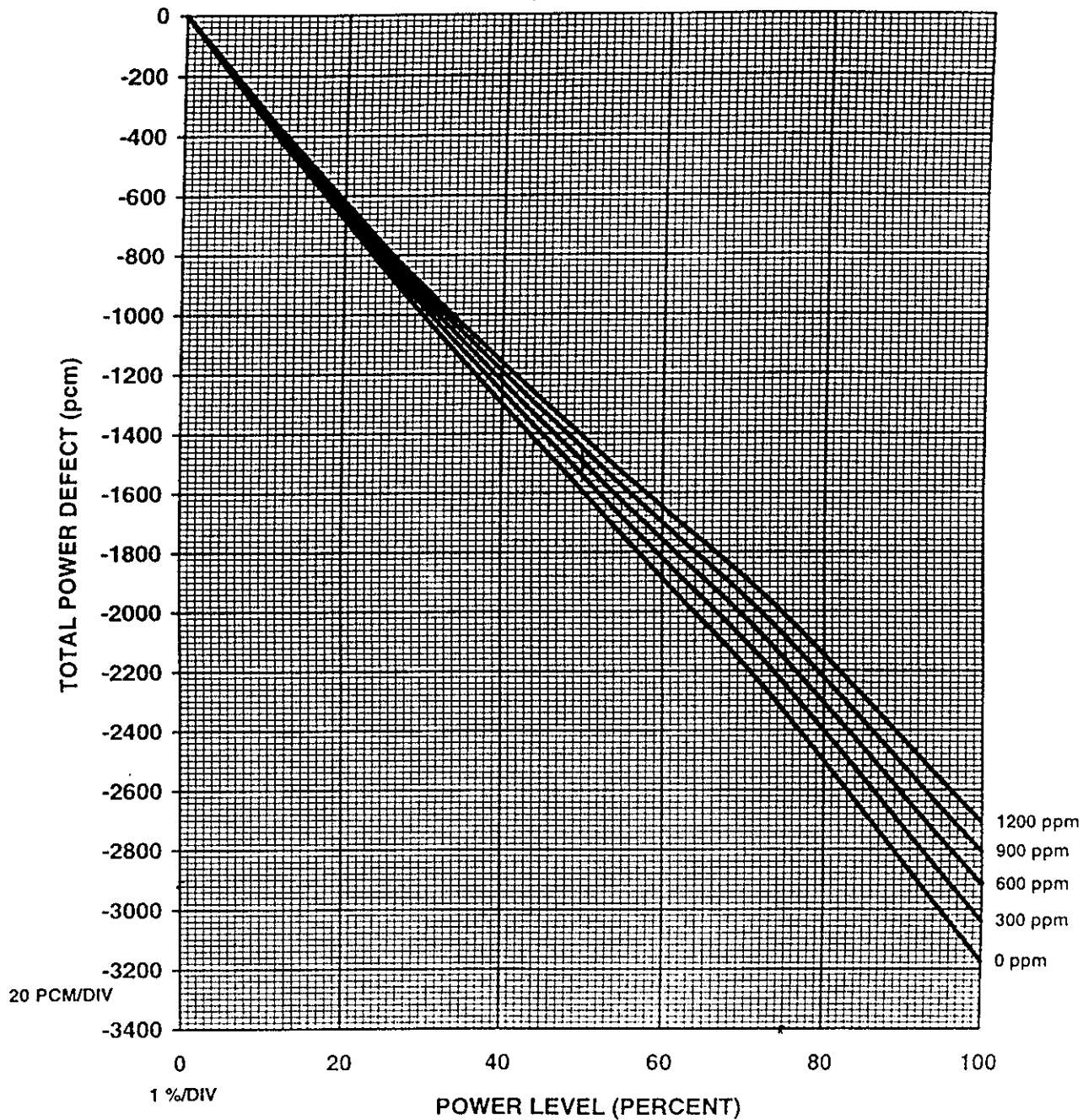
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ORIGINATOR	<i>Andrew E. Cross-Mint</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/29/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

HARRIS UNIT 1 CYCLE 11
POWER DEFECT vs. POWER LEVEL
for VARIOUS BORON CONCENTRATIONS
MOL (161 < EFPD ≤ 334)



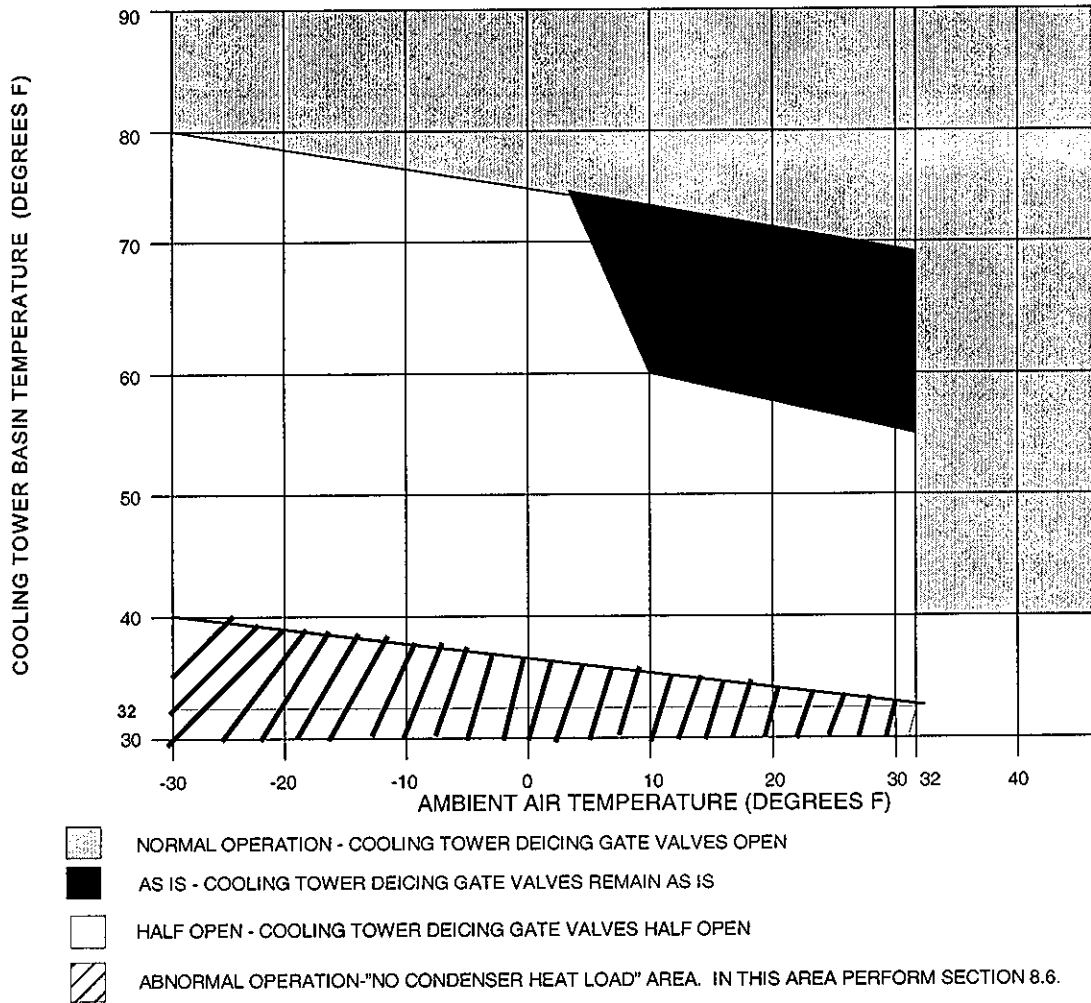
CURVE NO.	C-11-2	REV NO.	0
ORIGINATOR	<i>Andrew F. Conn-Prind</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/29/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/31/01

HARRIS UNIT 1 CYCLE 11
POWER DEFECT vs. POWER LEVEL
for VARIOUS BORON CONCENTRATIONS
EOL (334 < EFPD ≤ 507)



CURVE NO.	C-11-3	REV NO.	0
ORIGINATOR	<i>Andrew E. Gray-Mind</i>	DATE	10/25/01
SUPERVISOR	<i>[Signature]</i>	DATE	10/27/01
SUPERINTENDENT - SHIFT OPERATIONS	<i>[Signature]</i>	DATE	10/30/01

Cooling Tower Cold Weather Operation



provided as replacement for the one in the supplied references. Spec of one supplied eliminated normal ops shaded area. To all opp. cm.