CP&L

Carolina Power & Light Company
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

RNP File No: 13510
Serial: RNP-RA/98-0043

MAR 0 5 1998

Mr. Luis A. Reyes
Regional Administrator, Region II
United States Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
POST EXAMINATION COMMENTS FOR INITIAL OPERATOR
LICENSE EXAMINATIONS ADMINISTERED DURING FEBRUARY 1998

Dear Mr. Reyes:

This letter provides comments on the operating portion of the initial NRC license examination administered from February 23-27, 1998, at the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2. The enclosed comments are submitted in accordance with NUREG-1021, "Operator Licensing Examiner Standards," Section 402, "Administering Written Examinations at Power Reactors." In addition, the enclosure also includes the subject test questions and an excerpt from the applicable procedures that support the comments. Post examination comments are required to be submitted by March 6, 1998.

If you have any questions concerning this matter, please contact Mr. H. K. Chernoff of my staff.

Very truly yours,

John S. Keenan

J. S. Keenan

ALG/alg
Enclosure
c: USNRC Document Control Desk (w/o Enclosure)
Mr. J. W. Shea, USNRC Project Manager, HBRSEP (w/o Enclosure)
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United States Nuclear Regulatory Commission
Enclosure to Serial: RNP-RA/98-0043
16 Pages

ENCLOSURE

POST EXAMINATION COMMENTS FOR INITIAL OPERATOR
LICENSE EXAMINATIONS ADMINISTERED DURING FEBRUARY 1998

SRO(U) IP-018, Question 1

041 A4.06 - 2.9/3.1

REFERENCE ALLOWED

QUESTION:

Given the following plant conditions:

- Unit is in Mode 3, preparing for RCS cooldown
- Main Steam Isolation Valves (MSIVs) are closed

Assess the effects on RCS Tavg of lowering the SG PORV controller potentiometer settings on the RTGB.

ANSWER:

RCS Tavg would increase to a higher value.
(Not required for credit): Reverse acting controller ... lowering the potentiometer setting increases the setpoint causing the SG PORVs to open at a higher steamline pressure.

REFERENCE:

System Description, SD-031, section 4.2

Include as correct:

RCS Tavg would increase to a higher value if the SG PORV was open prior to the potentiometer setting being raised.
RCS Tavg would remain unchanged if the SG PORV was already closed.

RO Admin. A.4 (Fire Brigade), Question 1

2.4.25 - 2.9/3.4

REFERENCE ALLOWED

QUESTION:

Given the following plant conditions:

- 100% power, steady-state
- "A" Emergency Diesel Generator (EDG) was declared inoperable $6^1/_2$ days ago for planned maintenance on:
  - ⇒ the engine, auxiliaries and generator,
  - ⇒ ventilation supply and exhaust fans and associated dampers,
  - ⇒ fire detection and suppression system
- All work is complete on the "A" EDG except:
  - final assembly of the ventilation supply fan, scheduled to be complete in 24 hours

If the EDG Room door was propped open, would it be allowable to declare the EDG operable? Why or why not?

ANSWER:

The "A" EDG could not be declared operable. Blocking open a Diesel Room door does not provide enough ventilation flow to cool a running diesel.

REFERENCE:

FP-014, "Control of Fire Barrier Penetrations", Note prior to step 7.4.5.2

Include as correct:

The EDG can not be declared operable with the ventilation supply fan inoperable.

REFERENCE:

OWP-007, DG-1

CP&L

R
Reference
Use

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3
PART 10

OPERATIONS WORK PROCEDURE

OWP-007

DIESEL GENERATORS (DG)

REVISION 47

This procedure/activity has been screened in accordance with PLP-037 criteria and determined to be:
(check one)

CASE ONE ☐ CASE TWO ☐ CASE THREE ☐
N/A ☐

SUMMARY OF CHANGES

DATE	REVISION #	REVISION COMMENTS
11/10/97	47	This procedure has been reformatted/converted to Word. No text has changed.

TABLE OF CONTENTS

1. This revision has been verified to be the latest revision available.

Name (Print)	Initial	Signature	Date

2. System: "A" DG Work Request No: _____

3. Component: Diesel Generator "A"/Lube Oil Recirc Pump/Heater/Service Wtr Hx. Room Fans/Room Fan Breakers

4. Scope of Work: Repair Diesel Engine/Generator, repair Lube Oil Recirc Pump/Oil Heater/Service Water Hx., Repair Room Fans/Perform Inspections/Repair Breakers / Maintenance on Engine and/or Generator Control Panel / Maintenance on Solenoids.

5. Testing required on redundant equipment prior to rendering component inoperable: None

6. Precaution: 1) Ensure normal electrical lineup is maintained. 2) Refer to Tech Spec 3.7 (ITS LCO 3.8.1 or LCO 3.8.2) for EDG applicability and operability requirements. 3) Drain any fluid system to containers to prevent fluids from entering floor drains. 4) Ensure the air start solenoids are isolated prior to removing power to prevent the Diesel from starting. 5) The position for maintenance steps shall be performed in the established order to prevent thermal expansion of the service water side of the heat exchanger. 6) This activity has been screened IAW PLP-037 criteria and determined to be a Case Three activity. No additional management involvement is required beyond that routinely provided by first line supervision.

7. Valve/Breaker/Switch lineup has been completed. _____ / _____ (Signature / Date)

8. Clearance Issued (If applicable) Clearance No: _____

9. Testing required on redundant equipment while component is inoperable.
When the RCS temperature is greater than 200°F (MODES 1,2,3, or 4) use OP-604 Section 8.10 to perform the required actions.

10. I&C Maintenance lineup complete. N/A / _____ (Signature / Date)

11. Clearance removed and Valve/Breaker/Switch lineup restored to normal.

Signature / Date

12. Post Maintenance Testing.

a. Pressurize any liquid system worked on and check for leaks.

Signature / Date

b. Test operate Diesel Generator "A" per OST-401-1 or OST-409-1.

Signature / Date

c. Check Lube Oil Recirc Pump/Heater for proper operation and leaks, if repaired.

Signature / Date

d. For work on the engine, initial start of engine should be at low speed per OP-604/OST-401-1 to check for abnormal noise and vibration if required.

Signature / Date

e. Test run Diesel Generator "A" room fans

Signature / Date

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE	INITIALS	VERIFIED BY	RESTORED POSITION	INITIALS	VERIFIED BY
MAINTENANCE ON ENGINE ALONE						
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
Generator Output BKR 52/17B	OPEN, FUSES PULLED & RACKED OUT			RACKED IN, FUSES IN & OPERABLE		
RTGB Indication	LOST			RESTORED		
MAINTENANCE ON GENERATOR / ENGINE / GENERATOR CONTROL PANEL / ENGINE CONTROL PANEL / SOLENOIDS						
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DA-21A Diesel Starting Solenoid Outlet Isol.	CLOSED			LOCKED OPEN		
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DA-25A Diesel Starting Solenoid Outlet Isol.	CLOSED			LOCKED OPEN		
Generator Output BKR 52/17B	OPEN, FUSES PULLED & RACKED OUT			RACKED IN, FUSES IN & OPERABLE		
RTGB Indication	LOST			RESTORED		
DG "A" Exciter Supply (DC Dist. Panel "A" Ckt #8)	OPEN			CLOSED		
Emergency DC Excitation Supply Knife Switch	NORMAL			NORMAL		
DG "A" Control Power (DC Dist Panel "A" CKT #24)	BREAKER OPEN			BREAKER CLOSED		

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE			RESTORED POSITION		
MAINTENANCE ON COOLING WATER SYSTEM COMPONENTS						
		INITIALS	VERIFIED BY		INITIALS	VERIFIED BY
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DW-264 Demineralized Water Make-up to Expansion Tank	CLOSED			OPEN		
Jacket Coolant Heater "A" BKR (480V PWR Box "A" CB-2)	OPEN			CLOSED		
Standby Coolant Circ. Pump "A" BKR (480V PWR Box "A" CB-1)	OPEN			CLOSED		
DG-33A After Coolant Pump "A" Suction Drain	OPEN*			CLOSED*		
DG-34A Engine Driven Jacket Water Pump "A" Suction Drain	OPEN*			CLOSED*		
DG-35A Hx Shell Side Drain	OPEN*			CLOSED*		
DG-36A Hx Shell Side Vent	OPEN*			CLOSED*		

*N/A these steps if draining is not accomplished by this method.

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE		RESTORED POSITION	
	INITIALS	VERIFIED BY	INITIALS	VERIFIED BY
MAINTENANCE ON LUBE OIL SYSTEM COMPONENTS				
DG-18A lube Oil Strainer Drain Valve	OPEN_____	_____	CLOSED _____	_____
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED_____	_____	LOCKED OPEN _____	_____
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED_____	_____	LOCKED OPEN _____	_____
Lube Oil Recirc Pump "A" BKR (480V PWR Box "A" CB-4)	OPEN_____	_____	CLOSED _____	_____
DG-21A Lube Oil Prelube Pump Suction	CLOSED_____	_____	OPEN _____	_____
DG-23A Lube Oil Recirc Pump Suction	CLOSED_____	_____	OPEN _____	_____
Pre-Lube Pump "A" BKR (480V PWR Box "A" CB-3)	OPEN_____	_____	CLOSED _____	_____
Generator Output BKR 52/17B	OPEN, FUSES PULLED RACKED OUT_____	_____	RACKED IN, FUSES INSTALLED _____	_____
RTGB Indication	LOST_____		RESTORED _____	

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE		RESTORED POSITION	
MAINTENANCE ON SERVICE WATER HX				
	INITIALS	VERIFIED BY	INITIALS	VERIFIED BY
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED		LOCKED OPEN	
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED		LOCKED OPEN	
SW-85 TCV Inlet Isol.	CLOSED		OPEN	
SW-87 TCV Bypass	CLOSED		CLOSED	
SW-88 Coolers Return Isol.	CLOSED		OPEN	
DG-9A Coolers Vent	OPEN		CLOSED	
DG-12A Coolers Drain	OPEN		CLOSED	

MAINTENANCE ON HVS-6 FAN/BREAKER OR HVE-18 FAN/BREAKER				
	INITIALS	VERIFIED BY	INITIALS	VERIFIED BY
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED		LOCKED OPEN	
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED		LOCKED OPEN	
HVS-6 "A" Diesel Room Supply Fan Breaker (MCC-5)	OPEN		CLOSED	
HVE-18 "A" Diesel Room Exhaust Fan Breaker (MCC-5)	OPEN		CLOSED	

RO JPM CR-019, Question 1

004 A4.04 3.2/3.6
006 A1.02 3.0/3.6
006 A1.13 3.5/3.7

REFERENCE ALLOWED

QUESTION:
Given the following plant conditions:

- Mode 5, plant heatup / startup activities in progress
- "A" SI Accumulator level has just been raised from 50% to 70%
  - boron concentration was 1810 ppm prior to being filled
- RWST boron concentration is 2277 ppm

Determine the post-fill boron concentration in the "A" Accumulator and any compensatory actions, if required.

ANSWER:

- [.5] 1943 ppm

Formula: $C_1V_1 + C_2V_2 = C_3V_3$

$$C_3 = \frac{C_1V_1 + C_2V_2}{V_3}$$

$$= \frac{(1810\ ppm)(50\%) + (2277\ ppm)(20\%)}{(70\%)}$$

- [.5] ITS 3.5.1 not applicable in Mode 5. Entry into Required Action not required.

REFERENCE:
GFES
ITS 3.5.1

Delete this question due to it being technically inaccurate. The accumulator level transmitters are narrow range indication only and do not account for the entire volume of the accumulator.

RO JPM CR-019, Question 2

006 K1.03 4.2/4.3

REFERENCE ALLOWED

QUESTION:
Given the plant conditions:

- Mode 1, 100% power
- Accumulator levels / pressure
  - "A" 68% 600 psig
  - "B" 70% 630 psig
  - "C" 70% 645 psig

Annunciator APP-002-B4 "SI ACCUM A HI/LO PRESS" illuminated

QUESTION A:
Determine which accumulator parameter(s) are outside the normal operating band.

ANSWER A:
"A" Accumulator pressure is low (normal band = 614 to 646 psig)

REFERENCE ALLOWED

QUESTION B:
Can this evolution be performed and describe the basis for your response.

ANSWER B:
No, not allowed. Simultaneously opening the accumulator vent valves would connect the two accumulator gas spaces. If a large break LOCA were to occur on either of the loops ("A" or "C") both accumulators would depressurize invalidating the LOCA analysis.
(Not required for credit: Accumulator design capacity is based on one accumulator spilling to the containment floor through the break, the other two accumulators fill the core to the mid-plane.)

REFERENCE:
FSAR section 6.3.2.2.6
OP 202, step 4.20

Split these questions into Question 1 and Question 2 (due to deleting the accumulator boron concentration calculation).

Clarification on Question B (2): **"You have been directed to equalize "A" and "C" Accumulators.** Can this evolution be performed and describe the basis for your response."

RO JPM CR-023, Question 2

062 A4.07 3.7/4.2

REFERENCE ALLOWED

QUESTION:

Explain the basis for the interlock that prohibits prolonged operation with 4KV breakers

- **52/12**, START-UP TO 4KV BUS 2 AND **52/7**, UNIT AUX TO 4KV BUS 1
  AND
- **52/20**, UNIT AUX TO 4KV BUS 4 AND **52/19**, 4KV BUS 3-4 TIE BKR

closed at the same time.

ANSWER:

Prevents prolonged parallel operation of the Startup and Unit Auxiliary Transformers. Prolonged parallel operation is not desirable due to circulating currents caused by transformers not having load-sharing capability (speed droop).

REFERENCE:

LOGIC: CP-300-5379-4642

OP-603, "Electrical Distribution", step 4.2

Include as correct:

Prolonged parallel operation is not desirable due to **transformer damage from overheating / overloading.**

Prolonged parallel operation is not desirable due to **a single fault causing loss or damage to both transformers.**

REFERENCE:

KVAC Lesson Plan

a. Actuated by span bus differential, will open:

(1)East bus tie

(2)West bus tie

(3)Motor operated disconnect

(4)4KV bus 2 and 3 supply breakers 52/12 and 52/17

E. **4KV BUSES**

1. THINK button

OBJ. #8

a. Discussed above in 230KV controls and interlocks

b. THINK button as a 4KV breaker interlock

(1)Must be pressed simultaneously with breaker switch to open any 4KV supply/tie breaker operated from RTGB (same breakers are interlocked with synch selector interlock)

2. Other breaker interlock

Refer 4KV fast transfer Logic Diagram CP-300-5379-4642 **OBJ. #9,10**

a. Breakers 52/17 and 52/12 are interlocked such that they cannot be closed unless voltage is present on the SUT

b. Breakers 52/7 and 52/20 will not close unless the north or south generator breaker is closed

c. An UV condition on 4KV buses 1 and 4 will initiate automatic starting of the turbine driven auxiliary feed pump

Requires both 271 & 272 UV relays

d. Breaker 52/12 will trip automatically after 52/7 switch is released during manual closure (and vice versa)

(1)Interlock prevents prolonged parallel operation of transformers. Due to impedance differences, circulating currents can develop causing overload condition and possible loss of transformer

e. Breaker 52/19 will trip automatically after 52/20 switch

NRC RESOLUTION OF POST-EXAMINATION COMMENTS

EXAM: SRO (U)
JPM: IP-018
QUESTION : #1

Recommendation accepted. The additional information provided will be considered in the grading of this question.

EXAM: RO
ADMIN: A.4
QUESTION: #1

Recommendation accepted. The additional information provided will be considered in the grading of this question.

EXAM: RO and SRO(I)
JPM: CR-019
QUESTION: #1

Recommendation partially accepted, however, the question will not be deleted. It is acknowledged that the prescripted answer was technically incorrect, in that, the narrow range indication could not be used to calculate the concentration change due to the volume added. The applicants responses will be evaluated on their understanding of the concepts involved in concentration calculations and their knowledge of the design of the accumulators.

EXAM: RO and SRO(I)
JPM: CR-019
QUESTION: #2

Recommendation not accepted. Based on the decision for JPM CR-019, Question #1, it is not necessary to split the question to count for two questions.

EXAM: RO and SRO(I)
JPM: CR-023
QUESTION: #2

Recommendation accepted. The additional information provided will be considered in the grading of this question.

ROBINSON 98-301
Master RO
February 23-27, 1998

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information	
Name:	Region: II
Date:	Facility/Unit: H. B. Robinson
License Level: RO	Reactor Type: W
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected four hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results	
Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

ENCLOSURE 3

1. Given the following plant conditions:

   - Unit 2 is in cold shutdown
   - RCS is filled and there is a bubble in the PZR
   - RCS temperature is 190°F
   - RCS pressure is 385 psig
   - SUBCOOL T/C (Train A) is 255°F
   - SUBCOOL T/C (Train B) is 22°F

   Which ONE (1) of the following explains the above given indications?

   A. Loop 2 WR RTD failed high

   B. WR pressure transmitter PT-511AA failed low

   C. WR pressure transmitter PT-511BA failed low

   D. Loop 3 WR RTD failed high

2. Given the following plant conditions:

- The plant is operating at 100% power
- "B" Charging Pump is running
- CVC-200A, LTDN ORIFICE 45 GPM, is open
- The reactor operator notes the following
  - LT-115, VCT Level Transmitter, reads 24 inches (ERFIS)
  - LT-112, VCT Level Transmitter, reads 60 inches (ERFIS)

Which ONE (1) of the following describes the expected plant response assuming no operator actions?

A. LCV-115A, VCT/HLDP TK DIV, initially realigns to the VCT to prevent eventually losing charging pump suction.

B. LCV-115A, VCT/HLDP TK DIV, initially realigns to the CVCS HUTs and charging pump suction eventually shifts to the RWST.

C. VCT level will increase due to continuous auto makeup to the point of lifting the relief on the VCT.

D. VCT level will initially decrease and then level will be maintained by auto makeup.

3. Given the following plant conditions:

- The reactor has tripped
- Compensating voltage on N-35, Intermediate Range NI, is set too high

Which ONE (1) of the following describes the response of Intermediate Range Channel N-35 to the improperly set compensating voltage?

A. Indicates HIGH; preventing P-6 from automatically energizing the Source Ranges

B. Indicates LOW; causing P-6 to energize the Source Ranges prematurely

C. Indicates HIGH; the Source Range will be energized when P-6 is satisfied by the other IR channel (N-36)

D. Indicates LOW; the Source Range will be energized when P-6 is satisfied by the other IR channel (N-36)

4. Given the following plant conditions:

- The unit is initially in a normal 100% power lineup
- An electrical fault occurs which results in a loss of power to Instrument Bus 3

Which ONE (1) of the following describes the impact that the loss of Instrument Bus 3 has on the automatic operation of the Engineered Safeguards Actuation System?

A. Neither train of the Engineered Safeguards Actuation System is affected

B. The sequencers will not be able to automatically start any train "B" Engineered Safeguards Loads

C. The sequencers will not be able to automatically start any train "A" Engineered Safeguards Loads

D. The sequencers will not be able to automatically start any train "A" or "B" Engineered Safeguards Loads

5. Given the following plant conditions:

- A Refueling Outage is in progress
- The core has been offloaded to the Spent Fuel Pit
- There is a leak in the Spent Fuel Pit liner
- The Inside AO is making up to the Spent Fuel Pit with Primary Water to maintain level
- Primary Water is currently the only available source of makeup water to the Spent Fuel Pit

Which ONE (1) of the following describes the expected reactivity condition if the Spent Fuel Pit continues to be filled with Primary Water and the leak is not isolated?

A. K_{eff} may exceed 0.95 for fuel in both the normal fuel racks and high density racks.

B. K_{eff} would remain less than or equal to 0.95 for fuel in both the normal fuel racks and high density racks.

C. K_{eff} would remain less than or equal to 0.95 for fuel in the normal fuel racks but may exceed 0.95 for fuel in the high density racks.

D. K_{eff} would remain less than or equal to 0.95 for fuel in the high density fuel racks but may exceed 0.95 for fuel in the normal fuel racks.

6. Given the following plant conditions;

- The unit has tripped from a normal 100% power lineup
- A loss of offsite power has occurred
- Both Emergency Diesel Generators have failed to start
- The Startup Transformer cannot be reenergized
- It has been decided to implement EPP-025, "Energizing Supplemental Plant Equipment Using the DSDG"
- The desired source of power is BACKFEED

Which ONE (1) of the following correctly describes the flowpath through the major components used to deliver power to in-plant loads using this BACKFEED alignment?

A. 230 KV Switchyard, Breaker 52/9, Auxiliary Transformer, Main Transformer, 4 KV Bus 2

B. 115 KV Switchyard, Startup Transformer, 4 KV Bus 2

C. 115 KV Switchyard, Startup Transformer, 4 KV Bus 1

D. 230 KV Switchyard, Breaker 52/8, Main Transformer, Auxiliary Transformer, 4 KV Bus 1

7. Given the following plant conditions:

- Unit 2 is in mid loop operation to repair a S/G primary manway leak
- S/G "A" primary manways are removed
- The RCS is vented by two hot leg vents
- RCS level is -68" and rising very slowly
- RHR pump "A" is in service at 3500 gpm
- The operator notices that RHR flow and pressure are oscillating

Which ONE (1) of the following describes the appropriate operator actions to stabilize RHR flow and pressure?

A. Raise RCS level to -50 inches and stabilize RCS level

B. Stop RHR Pump "A", then start RHR Pump "B"

C. Lower RHR pump "A" flow and increase RCS level

D. Raise RHR flow to 4500 gpm and increase RCS level

8. Given the following plant conditions:

- A reactor startup is in progress following a refueling outage
- An automatic preaction sprinkler actuation has occurred for Containment Fire Zone 26

Which ONE (1) of the following describes the required actions IAW FP-001, "Fire Emergency"?

A. Dispatch as a minimum the Fire Brigade Team Leader to the fire zone to investigate.

B. Dispatch as a minimum the Fire Protection Technical Aide to the fire zone to investigate.

C. Sound the fire alarm and announce the location of the fire on the plant P.A. system.

D. Sound the fire alarm, dispatch the Fire Brigade and immediately contact the Hartsville Fire Department.

9. Given the following plant conditions:

- The unit is operating at 15% power
- The operations crew is performing a plant shutdown per GP-006, "Normal Plant Shutdown From Power Operation to Hot Shutdown"

Which ONE (1) of the following describes the reactor trip associated with pressurizer level?

A. Hi level trip must be manually blocked when the P-7 interlock is satisfied

B. Hi and Lo level trips must be manually blocked when the P-10 interlock is satisfied

C. Hi level trip is automatically blocked when the P-7 interlock is satisfied

D. Hi and Lo level trips are automatically blocked when the P-10 interlock is satisfied

10. Given the following plant conditions:

- A Service Water header break has occurred
- A Manual Reactor and Turbine trip is initiated
- Just prior to the plant trip, PT-1684, SW South Header, indicated 35 psig and PT-1616, SW North Header indicated 29 psig

Which ONE (1) of the following describes the expected response of the Service Water System after the trip if SW pressures remain the same?

A. V6-16A, Turbine Bldg S Header Isol will remain open, V6-16B, Turbine Bldg N Header Isol, will close, V6-16C, Turbine Bldg SW Isol, will remain open

B. V6-16A, Turbine Bldg S Header Isol will remain open, V6-16B, Turbine Bldg N Header Isol, will close, V6-16C, Turbine Bldg SW Isol, will close

C. V6-16A, Turbine Bldg S Header Isol, will close, V6-16B, Turbine Bldg N Header Isol, will remain open, V6-16C, Turbine Bldg SW Isol, will remain open

D. V6-16A, Turbine Bldg S Header Isol, will close, V6-16B, Turbine Bldg N Header Isol, will close, V6-16C, Turbine Bldg SW Isol, will close

11. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- The Fire Alarm Console (FAC) has the following alarms:
  - ZN-7 Fire Alm. TRN-A Aux. Feedwater Pump Room
  - ZN-7 Fire Alm. TRN-B Aux. Feedwater Pump Room
  - ZN-NO Fire Alm. TRN-NO M.D. Fire Pump Brkr. Trbl.
- The Fire Brigade has responded to a fire reported in the Motor Driven Auxiliary Feedwater Pump Room

Which ONE (1) of the following describes the status of the Fire Protection Water Pumps?

A. The Engine Driven Fire Pump has failed to start at 100 psig fire water header pressure, the Motor Driven Fire Pump Started when fire water header pressure dropped below 90 psig for greater than 2 seconds.

B. The Motor Driven Fire Pump has failed to start at 100 psig fire water header pressure, the Engine Driven fire pump started when fire water header pressure dropped below 90 psig for greater than 2 seconds.

C. The Jockey pump has tripped, the Motor Driven Fire Pump started when fire water header pressure dropped below 100 psig for greater than 2 seconds.

D. The Jockey pump has tripped, the Engine Driven Fire Pump started at 100 psig fire water header pressure

12. Given the following plant conditions:

- A loss of all AC power has occurred
- The direction has been given to depressurize the intact steam generators at the maximum rate to 240 psig or until RCS cold leg temperature is less than 320°F

Which ONE (1) of the following describes the basis for the limits during steam generator depressurization?

A. Both limits are based on PTS concerns

B. Both limits are based on nitrogen injection concerns

C. The steam generator limit is based on nitrogen injection, the RCS temperature limit is based on PTS concerns

D. The steam generator limit is based on PTS concerns, the RCS temperature limit is based on nitrogen injection

13. Given the following plant conditions:

- The unit is at 100% power
- LT-486, S/G "B" Water Level input to S/G Water Level Control has just failed low
- No Operator action is taken

Which ONE (1) of the following describes the plant response to this event?

The affected S/G level will.....

A. decrease until a LO-LO Level trip occurs.

B. increase until a FW Isolation and a turbine trip occurs.

C. increase until the flow error signal off-sets the level error signal.

D. decrease until the flow error signal off-sets the level error signal.

14. Given the following plant conditions:

- A loss of all AC power has occurred
- EPP-1, Loss of All AC Power, is in use
- An AO has been directed to complete Attachment 2, Load Shed Listing, to minimize DC loads

What ONE (1) of the following describes the status of Instrument Busses 2 and 3 following completion of Attachment 2?

A. Instrument Bus 2 and Instrument Bus 3 are de-energized

B. Instrument Bus 2 is energized with selected IB 2 loads being supplied, but Instrument Bus 3 is de-energized

C. Instrument Buses 2 and 3 are energized with all IB 2 & 3 loads being supplied

D. Instrument buses 2 and 3 are energized with selected IB 2 & 3 loads being supplied

15. Given the following plant conditions:

- The unit is at 80% power
- A failure of the #1 seal on RCP "A" has occurred
- AOP-18, "Reactor Coolant Pump Abnormal Conditions", has been entered
- The reactor and RCP "A" have been tripped

Which ONE (1) of the following is the basis for the delay in closing CVC-303A, Seal Water Leakoff valve, after tripping RCP "A" ?

A. A 60 second delay is required to ensure that the RCP has sufficient coastdown time to be rotating less than 100 RPM

B. A 60 second delay is required to ensure that the RCP has sufficient coastdown time to come to a complete stop

C. A 180 second delay is required to ensure that the RCP has sufficient coastdown time to be rotating less than 100 RPM

D. A 180 second delay is required to ensure that the RCP has sufficient coastdown time to come to a complete stop

16. Given the following plant conditions:

- A recovery from a small break LOCA is in progress
- No RCP s are running
- EPP-008, Post-LOCA Cooldown and Depressurization, is in use
- Depressurization of the RCS has commenced
- Pressurizer level has just risen rapidly from off-scale low to 50%

Which ONE (1) of the following describes the cause of the rapid increase in pressurizer level?

Depressurization of the RCS. . .

A. has increased RHR and SI flow which is rapidly refilling the pressurizer

B. is causing voiding to occur in the reactor vessel head which is rapidly refilling the pressurizer

C. is causing increased pressurizer spray flow which is rapidly refilling the pressurizer

D. is causing voiding in the pressurizer level reference leg which is providing an indication of rapidly increasing pressurizer level

17. Given the following plant conditions:

- Unit 2 is at 80% power
- Tavg is 570°F
- Rod Control is in Manual
- All other controls are in Automatic
- The turbine runs back to about 44% power, causing a 15°F Tavg - Tref deviation

Which ONE (1) of the following describes condenser steam dump and Tave response for the above conditions? Assume no operator action.

A. Three steam dump valves will trip open
No steam dump valves will modulate open
Tavg will stabilize at 559°F

B. No steam dump valves will trip open
Five steam dump valves will modulate open
Tavg will stabilize at 564°F

C. Three steam dump valves will trip open
Two steam dumps valves will modulate open
Tavg will stabilize at 559°F

D. Three steam dump valves will trip open
Two steam dump valves will modulate open
Tavg will stabilize at 564°F

18. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- Annunciator APP-036-D8, PROCESS MONITOR HI RAD, alarms
- R-15, Condenser Vacuum Pump Discharge Monitor, is in alarm
- There is no evidence of short term spiking on R-15

Which ONE (1) of the following best describes the **NEXT** operator action to be taken based on these plant conditions?

A. Momentarily depress the ALARM/RESET pushbutton and see if the alarm returns.

B. Reduce power in preparation for identifying and isolating the affected SG.

C. Ensure that SG Blowdown is isolated to prevent contaminating the Blowdown Flash Tank.

D. Notify Chemistry to perform isotopic analysis of S/G samples for leak rate determination.

19. Given the following plant conditions:

- The unit is performing a plant cooldown using the RHR System
- RHR-FCV-605, "RHR Loop Flow Control" valve, fails closed

Which ONE (1) of the following describes the effect on total RHR flow and cooldown rate? Assume NO Operator action.

A. Total RHR flow will increase and cooldown rate will decrease

B. Total RHR flow will decrease and cooldown rate will increase

C. Total RHR flow will decrease and cooldown rate will decrease

D. Total RHR flow will increase and cooldown rate will increase

20. Given the following plant conditions:

- The unit is operating at 100% power
- EDG "B" was fully loaded for surveillance testing. EDG load has just been reduced to allow EDG cooldown
- Bus E-2 load is divided between EDG "B" and the normal power supply to E-2
- A loss of the normal power supply to E-2 occurs

Which ONE (1) of the following describes the effect this loss of offsite power will have on EDG "B" operation? (Assume no operator action)

A. The EDG output frequency will decrease as it picks up more load (KW).

B. The EDG output frequency will increase as its load (KW) decreases.

C. The EDG output frequency will decrease as its load (KW) decreases.

D. The EDG output frequency will increase as it picks up more load (KW).

21. Given the following plant conditions:

- The unit is operating at 100% power
- Charging Pump "A" is running in automatic
- Annunciator APP-003-F5, CHG PMP MOTOR OVLD/TRIP, alarms
- Annunciator APP-001-C2, RCP #1 SEAL LEAKOFF HI TEMP, alarms
- A few minutes later the RO notes the #1 seal leakoff temperatures for RCP "B" is approximately 250°F

Which ONE (1) of the following describes the appropriate actions based on these conditions?

A. Immediately start at least one charging pump to restore seal injection to all three RCPs

B. Immediately start at least one charging pump to restore seal injection to RCP "B"

C. Locally close the RCP seal water flow control valve for RCP "B" and start at least one charging pump to restore seal injection to the RCPs

D. Locally close the RCP seal water flow control valves for RCPs "A" and "C" and start at least one charging pump to restore seal injection to the RCPs

22. Given the following plant conditions:

- The unit is operating at 100% power
- WGDT "A" is being released
- Annunciator APP-036-E7, RAD MONITOR TROUBLE, alarms
- The R-14C, Plant Vent Monitor, FAIL alarm is illuminated

Which ONE (1) of the following describes the impact of these conditions on the waste gas release in progress and the appropriate crew actions necessary to make a subsequent release?

A. The release will continue and must be manually stopped. Subsequent waste gas releases may be performed provided R-12, CV or Plant Vent Radioactive Gas Monitor, is selected to plant vent.

B. The release will continue and must be manually stopped. Subsequent waste gas releases may be performed provided two samples are analyzed and two facility staff members verify the release rate calculations and the discharge line valving.

C. The release automatically stops. Subsequent waste gas releases may be performed provided R-12, CV or Plant Vent Radioactive Gas Monitor, is selected to plant vent.

D. The release automatically stops. Subsequent waste gas releases may be performed provided two samples are analyzed and two facility staff members verify the release rate calculations and the discharge line valving.

23. Given the following plant conditions:

- The unit is operating at 100% power
- At 0900, Annunciator APP-001-D2, RCP #1 SEAL LEAKOFF HI FLOW, alarms
- At 0901, the RO reports #1 seal leakoff is 5.2 gpm for RCP "A"
- At 0905, the RO reports #1 seal leakoff is 5.8 gpm for RCP "A", and #1 seal leakoff for RCP "B" and RCP "C" has lowered from 3.0 to 2.0 gpm

Which ONE (1) of the following describes the appropriate operator actions and the basis for their order?

A. Trip the Reactor, then trip RCP "A", to prevent challenging a safety function

B. Trip the Reactor, then trip RCP "A", to allow PATH-1 actions to be completed prior to entering AOP-018, Reactor Coolant Pump Abnormal Conditions

C. Trip RCP "A", then verify the Reactor is tripped, to avoid delaying the RCP trip in the event an ATWS occurs

D. Trip RCP "A", then verify the Reactor is tripped, to ensure the actions of AOP-018, Reactor Coolant Pump Abnormal Conditions, are completed prior to entry into PATH-1

24. Given the following plant conditions:

- The unit is at 100% power
- Annunciator APP-001-A4, CCW SURGE TK HI/LO LVL, alarms
- CCW Surge Tank Level is 40% and lowering slowly
- AOP-14, Component Cooling Water Malfunction, has been entered
- Makeup from primary water is now maintaining CCW surge tank level at 47%

Which ONE (1) of the following actions should be performed from the Control Room to identify whether or not a CCW leak exists inside Containment?

A. Isolate CCW to the Containment and monitor CV Water Level (White Sump Lights)

B. Isolate CCW to the Containment and monitor CCW Surge Tank level.

C. Monitor the RCPs for any increase in temperature and monitor CV Water Level (White Sump Lights).

D. Monitor the RCPs for any increase in temperature and monitor the Control Rod Drive Mechanisms for any increase in temperature.

25. Given the following plant conditions:

- The unit is holding power at a steady level
- A second Main Feedwater Pump has just been started as directed by OP-105, Manuevering the Plant When Greater Than 25% Power
- Condensate Pump "B" Trips

Which ONE (1) of the following describes immediate operator actions which must be performed under these conditions?

A. Place the Steam Dump Mode Switch in STEAM PRESS and initiate a Manual Turbine Runback from the EH TURBINE CONTROL Panel to less than or equal to 500MW

B. Place the Steam Dump Mode Switch in STEAM PRESS and Check Main Feedwater Pumps - PUMP TRIP INDICATED

C. Check Feedwater Regulating Valves - OPERATING PROPERLY IN AUTO and initiate a Manual Turbine Runback from the EH TURBINE CONTROL Panel to less than or equal to 500MW

D. Check Feedwater Regulating Valves - OPERATING PROPERLY IN AUTO and Check Main Feed Pumps - PUMP TRIP INDICATED

26. Given the following plant conditions:

- Unit 2 is at 100% power
- Normal letdown is in service
- Pressurizer level control is in automatic
- VCT relief valve leak causes pressure in VCT to lower

Which ONE (1) of the following describes the effect of lowering VCT pressure?

A. No.1 and No. 2 seal leakoff flow from the RCPs will increase

B. No.1 and No. 2 seal leakoff flow from the RCPs will decrease

C. No. 1 seal leakoff flow from RCPs will decrease and No. 2 seal leakoff flow from RCPs will increase

D. No. 1 seal leakoff flow from RCPs will increase and No. 2 seal leakoff flow from RCPs will decrease

27. Given the following plant conditions:

- Unit 2 is in hot shutdown and heating up to 547°F
- RCS temperature is 300°F
- RCS pressure is 385 psig
- Pressurizer PORV 455C cycles for no apparent reason, causing the high discharge temperature alarm to annunciate
- Afterwards, RCS pressure continues to slowly decrease
- PRT pressure is 3 psig and rising slowly
- After several minutes the tailpipe temperature indicator for PCV-455C is at 330°F and slowly rising

Which ONE (1) of the following is correct concerning the PORV tailpipe temperature reading?

A. Tailpipe temperature is reasonable for the conditions given and will continue to rise as PRT pressure slowly rises

B. Tailpipe temperature is inconsistent for the conditions given, a more likely value for a leaking PORV is somewhere around 220°F

C. Tailpipe temperature is inconsistent for the conditions given, a more likely value for a leaking PORV is somewhere around 445°F

D. Tailpipe temperature is reasonable for the conditions given and will remain constant as PRT pressure slowly rises

28. Given the following plant conditions:

- The unit was initially in a normal 100% power lineup
- Emergency Diesel Generator "A" is then started and paralleled to the E-1 Bus for surveillance testing

Which ONE (1) of the following describes the operation of the diesel generator voltage control knob while EDG "A" is operating in paralled with E-1?

A. Lowering the voltage control knob will cause the generator to pick up a larger share of the reactive load

B. Raising the voltage control knob will cause the generator to pick up a larger share of the reactive load

C. Raising the voltage control knob will cause the generator to pick up a larger share of the real load

D. Lowering the voltage control knob will cause the generator to pick up a larger share of the real load

29. Given the following plant conditions:

- A Reactor Trip and Safety Injection have occurred
- Containment pressure is 4.8 psig
- Core exit thermocouples indicate 557°F
- RCS Pressure is 1485 psig
- Both SI Pumps are running

Which ONE (1) of the following describes the appropriate operator action for these conditions and the basis for this action?

A. Maintain the RCPs running to provide heat removal through the break and the S/Gs.

B. Maintain the RCPs running to provide a two phase mixture above the break longer.

C. Trip the RCPs to prevent possible core uncovery if the RCPs are tripped later in the accident.

D. Trip the RCPs to prevent damage to the RCPs due to a loss of cooling water.

30. Given the following plant conditions:

- A Reactor Trip and Safety Injection have occurred
- A loss of offsite power has occurred
- EDG "A" has started and energized E-1
- EDG "B" failed to start, leaving E-2 deenergized

Which ONE (1) of the following describes which Safety Injection System valves **can be** operated from the RTGB under these conditions?

A. SI-870A, BIT Outlet Valve, SI-864A, RWST Discharge Valve, and SI-866A, Hot Leg Injection Valve

B. SI-870A, BIT Outlet Valve, SI-864A, RWST Discharge Valve, and SI-866B, Hot Leg Injection Valve

C. SI-870B, BIT Outlet Valve, SI-864B, RWST Discharge Valve, and SI-866A, Hot Leg Injection Valve

D. SI-870B, BIT Outlet Valve, SI-864B, RWST Discharge Valve, and SI-866B, Hot Leg Injection Valve

31. Given the following plant conditions:

- The unit at 100% power
- Letdown is isolated for maintenance on LCV-115A, "VCT/HOLDUP TANK DIVERSION"
- Excess letdown is in service
- Charging pump "A" is running in manual at minimum speed
- Seal injection flowrates are as follows:
  - RCP "A" 9 gpm
  - RCP "B" 5 gpm
  - RCP "C" 7 gpm

Which ONE (1) of the following describes the compliance of the current conditions with plant Technical Specifications and how seal injection flow must be adjusted as a result?

Seal Injection flow(s) on . . .

A. RCP "B" is below the Technical Specification limit. Throttle open on CVC-297B, the individual seal injection valve for RCP "B".

B. RCPs "B" and "C" are below the Technical Specification limit. Throttle open on CVC-297B and C, the individual seal injection valves for RCPs "B" and "C".

C. RCP "B" is below the Technical Specification limit. Throttle closed charging valve HCV-121 to increase seal injection flow, then throttle open on CVC-297B, the individual seal injection valve for RCP "B".

D. RCPs "B" and "C" are below the Technical Specification limit. Throttle closed charging valve HCV-121 to increase seal injection flow, then throttle open on CVC-297B and C, the individual seal injection valves for RCPs "B" and "C".

32. Given the following plant conditions:

- A reactor startup is in progress in accordance with GP-003, "Normal Plant Startup From Hot Shutdown to Critical"
- T_{avg} is 547°F
- All Control Rods are fully inserted

Which ONE (1) of the following correctly describes the latest time that Mode 2, "Startup" should be entered in accordance with GP-003?

A. Prior to withdrawing Shutdown Bank "A"

B. When Shutdown Bank "A" is greater than 20 steps

C. Prior to withdrawing Shutdown Bank "B"

D. When Shutdown Bank "B" is greater than 20 steps

33. Given the following plant conditions:

- The plant was operating at 100% power
- A reactor trip and loss of off-site power has occurred
- Emergency Busses E-1 and E-2 have been energized by the Emergency Diesel Generators

Which ONE (1) of the following describes the equipment which will be started by the Blackout Sequencer?

A. Charging Pump "B" and Auxiliary Feedwater Pump "A"

B. Charging Pump "B" and Service Water Pump "D"

C. Service Water Pump "A" and Service Water Pump "D"

D. Service Water Pump "A" and Auxiliary Feedwater Pump "A"

34. Given the following plant conditions:

- A Natural Circulation Cooldown is in progress
- CST level is 9%
- RCS temperature is 495°F
- AFW supply has been switched to the deepwell pumps
- The Steam Driven AFW Pump is out of service for maintenance
- Both Motor Driven AFW Pumps are running
- The Motor Driven AFW Pump Discharge Flow Control Valves, FIC-1424 and FIC-1425, have been set to 200 gpm EACH

Which ONE (1) of the following describes the requirements for the deepwell pumps?

A. Must have at least ONE deepwell pump running

B. Must have at least TWO deepwell pumps running

C. Must have at least THREE deepwell pumps running

D. The above flowrate exceeds the capacity of THREE deepwell pumps

35. Given the following plant conditions:

- RCS pressure is 1875 psig and decreasing
- Steam Generator pressures are:

  A = 400 psig and decreasing
  B = 980 psig
  C = 970 psig

- Tavg is 537°F and decreasing
- Steam Flows are:

  A = $1x10^6$ lbm/hr
  B = zero
  C = zero

Which ONE (1) of the following ESF signals will actuate Safety Injection at this time to provide protection under these conditions?

A. Low Pressurizer Pressure.

B. High Steamline Differential Pressure.

C. High Steam Line Flow with Low Tavg.

D. High Steam Line Flow with Low Steam Line Pressure.

36. Given the following plant conditions:

- An ATWS has occurred
- FRP-S.1 has been entered
- CV pressure has increased to 6.5 psig
- S/G levels are as follows:
  - "A" S/G Narrow Range level is 15%
  - "B" S/G Narrow Range level is 15%
  - "C" S/G Narrow Range level is 10%

Which ONE (1) of the following describes the MINIMUM amount of total Auxiliary Feedwater flow required to provide an adequate secondary heat sink?

A. No feedwater flow required

B. 300 gpm

C. 325 gpm

D. 600 gpm

37. Given the following plant conditions:

- RNP 2 is at 100% power
- Control bank "D" is at 200 steps
- Delta I is + 2% and stable
- All control systems are in automatic
- To compensate for fuel depletion the operator sets up and dilutes 20 gallons
- Due to a makeup control system malfunction, 500 gallons of water is added to the VCT
- In response to the malfunction, the operator drives control rods inward to maintain Tavg within 0.5°F of Tref

Which ONE (1) of the following describes the effects on, Delta I and Rod Insertion Limit after the rods are inserted and the plant is stabilized?

A. Delta I will rise (more positive)
Rod Insertion Limit will remain the same

B. Delta I will lower (less positive)
Rod Insertion Limit will lower

C. Delta I will lower (less positive)
Rod Insertion Limit will remain the same

D. Delta I will rise (more positive)
Rod Insertion Limit will lower

38. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- Annunciator APP-036-H2, "BA HEAT TRACE TROUBLE" has alarmed
- You dispatched an Auxiliary Operator (AO) to investigate the alarm
- The AO reports Number E5 B.A. FILTER heat tracing circuit is reading 148°F
- It has been determined that the low temperature is due to a malfunction of heat tracing and the backup heat tracing circuit is under clearance for repair

Which ONE (1) of the following explains the appropriate action to take in response to this situation and its basis?

A. Immediately establish flow through the system and determine if the affected boric acid flow path is still inoperable due to the inability to maintain boric acid in solution in the affected path.

B. Immediately have chemistry sample the affected flowpath and determine if the affected boric acid flow path is still inoperable due to the inability to maintain boric acid in solution in the affected path.

C. Immediately establish flow through the system and reduce the concentration in the Boric Acid Tanks to less than 2000 ppm.

D. Immediately have chemistry sample the affected flowpath and reduce the concentration in the Boric Acid Tanks to less than 2000 ppm.

39. Given the following plant conditions:

- The "B" and "C" S/Gs have completely blown down to the Containment and have no indicated level
- Containment Spray has automatically actuated
- RCS Subcooling is 58°F
- Operators are performing PATH-1 actions
- Charging Pumps "A" and "B" are running

Which ONE (1) of the following describes correct operator response to the above situation?

A. Trip the RCPs immediately based on Foldout "A" conditions.

B. Continue to run the RCPs since there is adequate seal injection flow.

C. Continue to run the RCPs until subcooling is less than 35°F.

D. Trip the RCPs immediately to protect them from overheating due to loss of cooling water

40. Given the following plant conditions:

- The unit is initially in a normal 100% power lineup
- At 0130, a reactor trip occurs
- At 0133, a loss of all AC Power occurs

Which ONE (1) of the following describes the design basis time that the safety related 125VDC Battery system is required to carry the vital loads following a loss of battery charger and the time by which compensatory action is required by procedure?

	Design Basis Time Limit	Procedural Time Limit
A.	0230	0200
B.	0233	0203
C.	0330	0230
D.	0333	0233

41. Given the following plant conditions:

- Unit 2 is at 100% power
- The following radiation monitors go into alarm:

  Condenser Air Ejector Gas Monitor R-15.

  Condensate Polisher Waste Effluent Monitor R-37.

  S/G Sample Radiation Monitor R-19A.

Which ONE (1) of the following describes the correct response to the above given conditions?

A. FCV-1933A and B, S/G A Blowdown Sample Isolation Valves REMAIN OPEN
RCV-10549, Condensate Polisher Discharge to Catch Basin CLOSES

B. FCV-1933A and B, S/G A Blowdown Sample Isolation Valves CLOSE
V1-31, Blowdown Isolation Valve to Catch Basin, CLOSES

C. FCV-1933A and B, S/G A Blowdown Sample Isolation Valves CLOSE
RCV-10549, Condensate Polisher Discharge to Catch Basin CLOSES

D. FCV-1933A and B, S/G A Blowdown Sample Isolation Valves REMAIN OPEN
V1-31, Blowdown Isolation Valve to Catch Basin, CLOSES

42. Given the following plant conditions:

- Pressurizer Level Control Transfer Switch, LM-459, is in "461 RPL 459" due to maintenance
- Pressurizer Level Transmitter LT-460 fails low

immediate or initial

Which ONE (1) of the following describes the response of the Pressurizer Level Control System with no operator action?

	Charging Pump Speed	Heaters Affected	Letdown Isolation
A.	Increase	Yes	Yes
B.	Increase	No	No
C.	Unaffected	No	No
D.	Unaffected	Yes	Yes

43. Given the following plant conditions:

- The unit is at 100% power
- Condensate Pump "A" trips

Assuming no operator action is taken, which ONE (1) of the following describes the S/G level and **minimum** number of channels required by design to initiate the first Reactor Trip signal?

A. S/G level < 16% on 1/3 channels from 2/3 S/Gs

B. S/G level < 16% on 1/2 channels from 1/3 S/Gs

C. S/G level < 30% on 1/2 channels from 1/3 S/Gs

D. S/G level < 30% on 1/3 channels from 2/3 S/Gs

44. Given the following plant conditions:

- The plant is at 25% power during power ascention after a forced outage
- Decreasing RCS pressure is annunciated and responded to by the operators
- AOP-019, Malfunction of RCS Pressure Control, has been entered
- Pressurizer spray valve, PCV-455B, is determined to be stuck partially open based on dual indication with a closed demand signal
- At 1015 the RO reports RCS pressure is 2010 psig and decreasing at 10 psig/min and an operator is dispatched to the containment to isolate the spray valve
- At 1030 the operator dispatched to containment reports he is ready to enter containment

Which ONE (1) of the following describes the appropriate crew response to these conditions?

A. Reduce power to less than 10%, then stop RCP "C" and implement applicable technical specifications

B. Stop RCP "C" and implement applicable technical specifications

C. Reduce power to less than 10%, then stop RCP "B" and implement applicable technical specifications

D. Stop RCP "B" and implement applicable technical specifications

45. Given the following plant conditions:

- The plant was operating at 100% power
- A reactor trip and loss of off-site power has occurred
- EPP-001 "Loss of All AC Power" has been entered
- EDG "A" is out of service for maintenance
- EDG "B" has failed to start
- An operator is dispatched to remove control power fuses for various E-1 and E-2 Loads

Which ONE (1) of the following describes the basis for removing the control power fuses under these conditions?

To defeat the automatic starting of . . .

A. the Charging Pumps to prevent thermal shock to the RCP seals

B. the Safety Injection Pumps to prevent exceeding PTS limits

C. large loads to prevent the possible overloading of E-1 and E-2

D. the Service Water Pumps to prevent overloading the EDGs

46. Given the following plant conditions:

- The plant was initially at 100% power with "B" CCW Pump running
- A Reactor Trip and Safety Injection have occurred
- The normal supply breakers to E-1 and E-2 have tripped on degraded voltage
- Power to E1 and E2 is being supplied by the EDGs

Which ONE (1) of the following describes the automatic action(s) associated with the Component Cooling Water (CCW) system for these conditions?

A. "A" and "B" CCW pumps will start.

B. "B" and "C" CCW pumps will start.

C. "A" CCW pump will start on low pressure if power is available to the Dedicated Shutdown bus

D. "C" CCW pump will start on low pressure if power is available to the Dedicated Shutdown bus.

47. Given the following plant conditions:

- Loss of ALL AC power has occurred
- EPP-001, "Loss of ALL AC Power", was entered and completed
- The plant is recovering using EPP-002 "Loss of ALL AC Power Recovery Without SI Required"

Which ONE (1) of the following describes indications which support the existence of natural circulation IAW Supplement E, "Natural Circulation Verification"?

A. Core Exit T/Cs DECREASING and RCS Hot Leg Temperature trending to saturation temperature for steam pressure

B. Core Exit T/Cs DECREASING and Steam Pressure DECREASING

C. RCS Cold Leg Temperature STABLE and RCS Hot Leg Temperature trending to saturation temperature for steam pressure

D. RCS Cold Leg Temperature STABLE and Steam Pressure DECREASING

48. Given the following plant conditions:

- The unit was initially in a normal 100% power lineup
- A loss of an instrument bus 9 has occurred
- AOP-24, "Loss of Instrument Bus" has been entered
- Instrument Bus 9 has just been reenergized

Which ONE (1) of the following describes the affect of restoring power to a manual/auto control station powered by Instrument Bus 9 if the controller was originally in the manual mode?

A. MAN light comes on for 15-20 seconds then goes out and controller shifts to automatic.

B. MAN light comes on but the controller may be shifted to automatic anytime.

C. AUTO light comes on but the controller may be returned to manual anytime.

D. AUTO light comes on for 15-20 seconds then goes out and controller shifts to manual.

49. Given the following plant conditions:

- A major oil fire at Unit 1 has caused the Unit 2 Control Room to fill with black smoke
- The Control Room has been evacuated in accordance with AOP-004, "Control Room Inaccessibility"
- The operators are attempting to maintain hot shutdown conditions
- RCS Hot Leg Temperature is 532°F
- RCS Cold Leg Temperature is 522°F
- RCS pressure is 905 psig

Which ONE (1) of the following describes the state of RCS?

A. Saturated

B. 3 °F Subcooled

C. 10 °F Subcooled

D. 13 °F Subcooled

50. Given the following plant conditions:

- The plant was initially at 100% power
- A Reactor Trip has occurred due to a loss of all Main Feedwater
- The operations crew has been unable to establish Auxiliary Feedwater to the Steam Generators
- A Pressurizer PORV has cycled several times causing the PRT to rupture
- Containment pressure is 2.5 psig and slowly increasing

Which ONE (1) of the following describes plant conditions for which RCS feed and bleed should be initiated?

A. Any one S/G level less than 26% wide range.

B. Any two S/G's level less than 26% wide range.

C. Any one S/G level less than 37% wide range.

D. Any two S/G's level less than 37% wide range.

51. Given the following plant conditions:

- The Unit is at 100% power
- Dual train fire alarm is received for the Unit 2 Cable Spreading Room
- Upon investigation it was determined that the installed fire suppression system in the Cable Spreading Room did not actuate

Which ONE (1) of the following would be primary backup means of extinguishing the fire?

A. Foam

B. High Velocity Fog Water Application

C. 150 pound Wheeled Halon

D. CO_2 from the E-1/E-2 Switchgear Room

52. Given the following plant conditions:

- A Site Area Emergency is declared
- An individual is injured and trapped in an 100 R/hr gamma radiation field

Which ONE (1) of the following represents the maximum planned stay time that an individual should be given in order to rescue the individual?

A. 6 minutes

B. 15 minutes

C. 45 minutes

D. 60 minutes

53. Given the following plant conditions:

- The unit was in a normal 100% power lineup
- A Large Break LOCA causes a Reactor Trip and Safety Injection at time 11:15:00
- Containment Pressure is 25 psig at time 11:15:03

Which ONE (1) of the following describes the correct order in which loads, if not previously running, will start?

A. SI Pumps, Containment Ventilation Fans (HVH-1 through 4), CV Spray Pumps

B. SI Pumps, CV Spray Pumps, Containment Ventilation Fans (HVH-1 through 4)

C. CV Spray Pumps, Containment Ventilation Fans (HVH-1 through 4), SI Pumps

D. CV Spray Pumps, SI Pumps, Containment Ventilation Fans (HVH-1 through 4)

54. Given the following plant conditions:

- Unit 2 is in Cold Shudown in preparation for Refueling
- Maintenance is planning to disassemble and inspect the SI Pump "C"
- A clearance is issued

Which ONE (1) of the following describes the proper sequence specified by OPS-NGGC-1301 for installing this clearance to prevent damage to equipment?

A. Shut and tag the pump discharge valve, shut and tag the pump suction valve, tag the pump's motor breaker open, place a tag or red cap on the control switch

B. Shut and tag the pump suction valve, shut and tag the pump discharge valve, place a tag or red cap on the control switch, tag the pump's motor breaker open

C. Place a tag or red cap on the control switch, tag the pump's motor breaker open, shut and tag the pump discharge valve, shut and tag the pump suction valve

D. Tag the pump's motor breaker open, place a tag or red cap on the control switch, shut and tag the pump suction valve, shut and tag the pump discharge valve

55. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- The stroke time for V2-16A, Aux Feedwater Header Discharge to S/G "A", is being measured in accordance with OST-201-1
- The acceptance criteria is 55 sec
- The valve took 57 sec to open as measured by the indicating lights on the RTGB
- The operator stationed at the valve measured a stroke time of 54 sec based strictly on stem travel

Which ONE (1) of the following describes the impact on valve operability and the appropriate actions to take?

A. The valve is still operable because the stroke time measured at the valve meets the acceptance criteria.

B. The valve is still operable. Exercise the valve until a stroke time, as measured by the indicating lights on the RTGB, that meets the acceptance criteria is obtained. If still unable to meet the criteria, then conduct an investigation.

C. Declare the valve inoperable. Perform an investigation to determine the reason for the test failure.

D. Declare the valve inoperable. Exercise the valve until a stroke time, as measured by the indicating lights on the RTGB, that meets the acceptance criteria is obtained. If still unable to meet the criteria, then conduct an investigation.

56. Given the following plant conditions:

- You have just completed OST-010 (Power Range Calorimetric During Power Operation) with the following results:

  1. Power Range Nuclear Instrument Readings
     *N-41: 97.3%
     *N-42: 99.5%
     *N-43: 99.4%
     *N-44: 101.6%

  2. Calculated power level: 99.5%

- The Nuclear Instrument Readings must be rounded off in accordance with the guidelines of OST-010.

Which ONE (1) of the following describes the appropriate actions to take based on these results?

A. Only N-41 is required to be adjusted to within 2% of calculated power to remain operable

B. Only N-44 is required to be adjusted to within 2% of calculated power to remain operable

C. N-41 and N-44 are required to be adjusted to within 2% of calculated power to remain operable

D. All Power Range channels are acceptable as specified by OST-010

57. Given the following plant conditions:

- A plant cooldown is in progress in accordance with GP-007, Plant Cooldown From Hot Shutdown to Cold Shutdown
- RCS Pressure is 1900 psig
- Tavg is 515°F
- Plant Cooldown has been initiated
- A RCS leak is identified in the CV

Which ONE (1) of the following describes the signals which will result in a Containment Ventilation Isolation under these conditions?

A. Low pressurizer pressure Safety Injection OR an alarm on R-12, Containment Noble Gas Monitor

B. Low pressurizer pressure Safety Injection OR an alarm on R-14C, Plant Effluent Noble Gas Monitor

C. Manual actuation of Containment Isolation Phase A OR an alarm on R-12, Containment Noble Gas Monitor

D. Manual actuation of Containment Isolation Phase A OR an alarm on R-14C, Plant Effluent Noble Gas Monitor

58. Given the following plant conditions:

- The plant is being cooled down for a refueling outage
- As RCS temperature and pressure are reduced, annunciator "PCV-455C LP PROT ACT/TROUB" comes in

Which ONE (1) of the following are potential reasons for this annunciator to be illuminated?

1. The LTOPP mode control switch is in NORMAL with the lowest RCS Cold Leg Temperature equal to 358°F
2. The LTOPP mode control switch is in LOW PRESSURE with RCS pressure equal to 425 psig and RCS temperature equal to 350°F
3. The LTOPP mode control switch is in LOW PRESSURE with the highest RCS Cold Leg Temperature equal to 368°F
4. The LTOPP mode control switch is in LOW PRESSURE with RC-536 PORV Block valve closed

A. 2, 3, 4

B. 1, 3, 4

C. 1, 2, 4

D. 1, 2, 3

59. Given the following plant conditions:

- The unit is at 75% for turbine valve testing
- An RCS leak has been identified
- AOP-016, Excessive Primary Plant Leakage, has been entered
- RCS Pressure is 1875 psig
- Tavg is 568°F
- Containment pressure is 3.8 psig
- PZR level is 9%

Which ONE (1) of the following describes the correct operator/plant response under these conditions and the basis for this response?

A. A manual reactor trip is required due to subcooling less than required, leak rate is greater than makeup capability

B. A manual reactor trip is required due to PZR level less than required, leak rate is greater than makeup capability

C. An automatic reactor trip should have occurred due to CV pressure, a manual reactor trip is necessary due to the failure of the Reactor Protection System

D. An automatic reactor trip should have occurred due to low RCS pressure, a manual reactor trip is necessary due to the failure of the Reactor Protection System

60. Given the following plant conditions:

- The unit is in Mode 3
- Both PORVs are inoperable due to maintenance
- A plant transient occurs and you observe the following indications
  - Highest cold leg temperature = 620 degrees F
  - RCS pressure = 2740 psig.

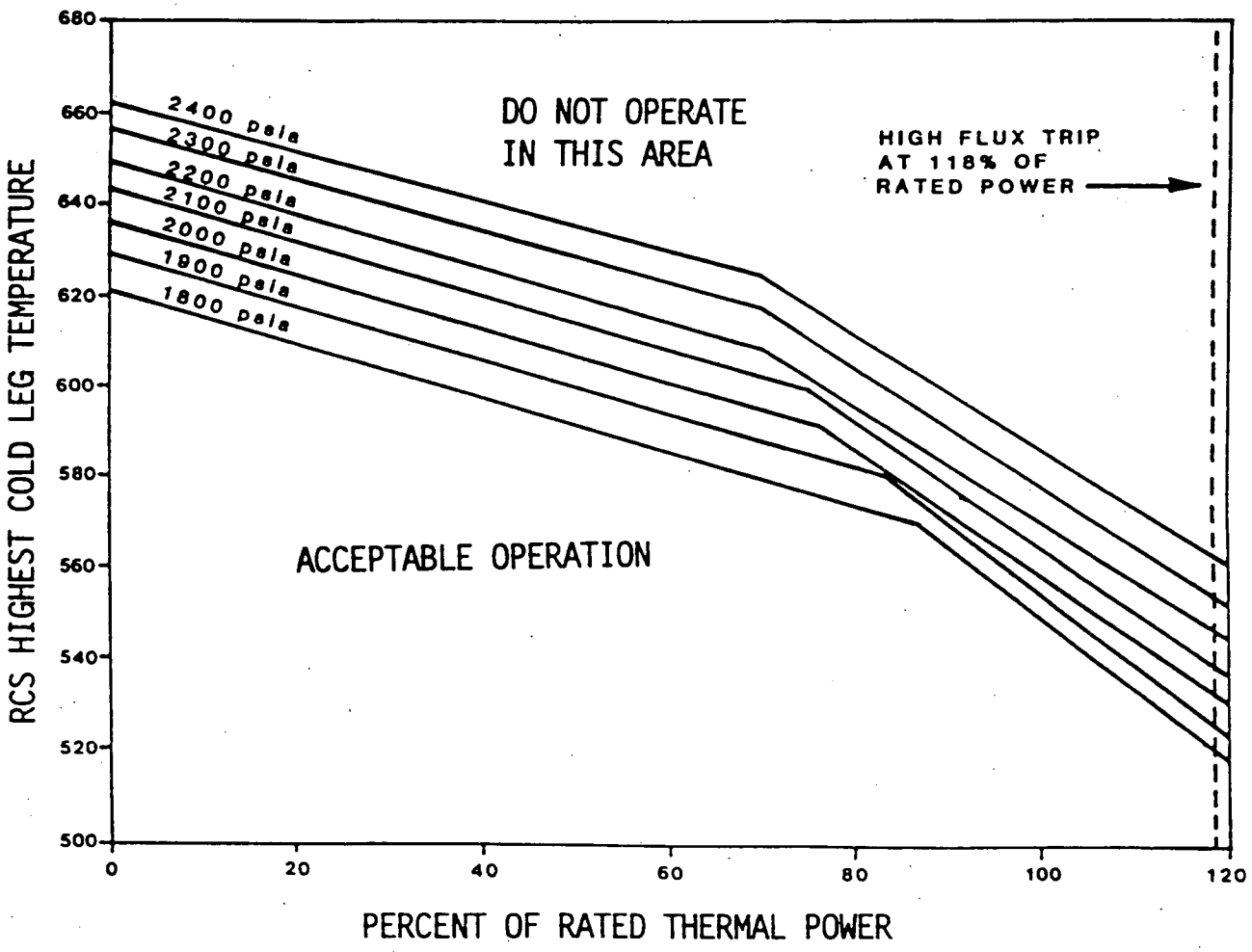
Which ONE (1) of the following describes the Safety Limits which have been violated? (Figure 2.1.1-1 provided)

A. No Safety Limits have been violated.

B. The RCS Pressure Safety Limit has been violated.

C. The combination of thermal power, highest cold leg temperature and RCS pressure Safety Limit has been violated.

D. Both Safety Limits have been violated.



NOTE: BASED ON A MINIMUM RCS FLOW OF 97.3×10^6 lbm/hr

Figure 2.1.1-1 (page 1 of 1)
Reactor Core Safety Limits

61. Given the following plant conditions:

- Unit 2 is stable at 68% after a dropped rod turbine runback
- The dropped rod has been recovered in accordance with AOP-001, Malfunction of the Reactor Control System
- The system dispatcher requests Robinson Unit 2 raise power to $\geq$ 90% due to system load
- The Chemistry Supervisor reported Dose Equivalent Iodine is 70 microcuries per gram after the power reduction

Which ONE (1) of the following describes the correct response to these conditions? (ITS Figure 3.4.16-1 provided)

A. Power can not be raised above the current level, Dose Equivalent Iodine must be restored to below the Technical Specification limit of 60 microcuries per gram within 48 hours.

B. Power can be raised to 80%, Dose Equivalent Iodine must be restored to below the Technical Specification limit of 60 microcuries per gram within 48 hours.

C. Power can be raised to 76%, Dose Equivalent Iodine must be restored to below the Technical Specification limit of 1 microcurie per gram within 48 hours.

D. Power can not be raised above the current level, Dose Equivalent Iodine must be restored to below the Technical Specification limit of 1 microcurie per gram within 48 hours.

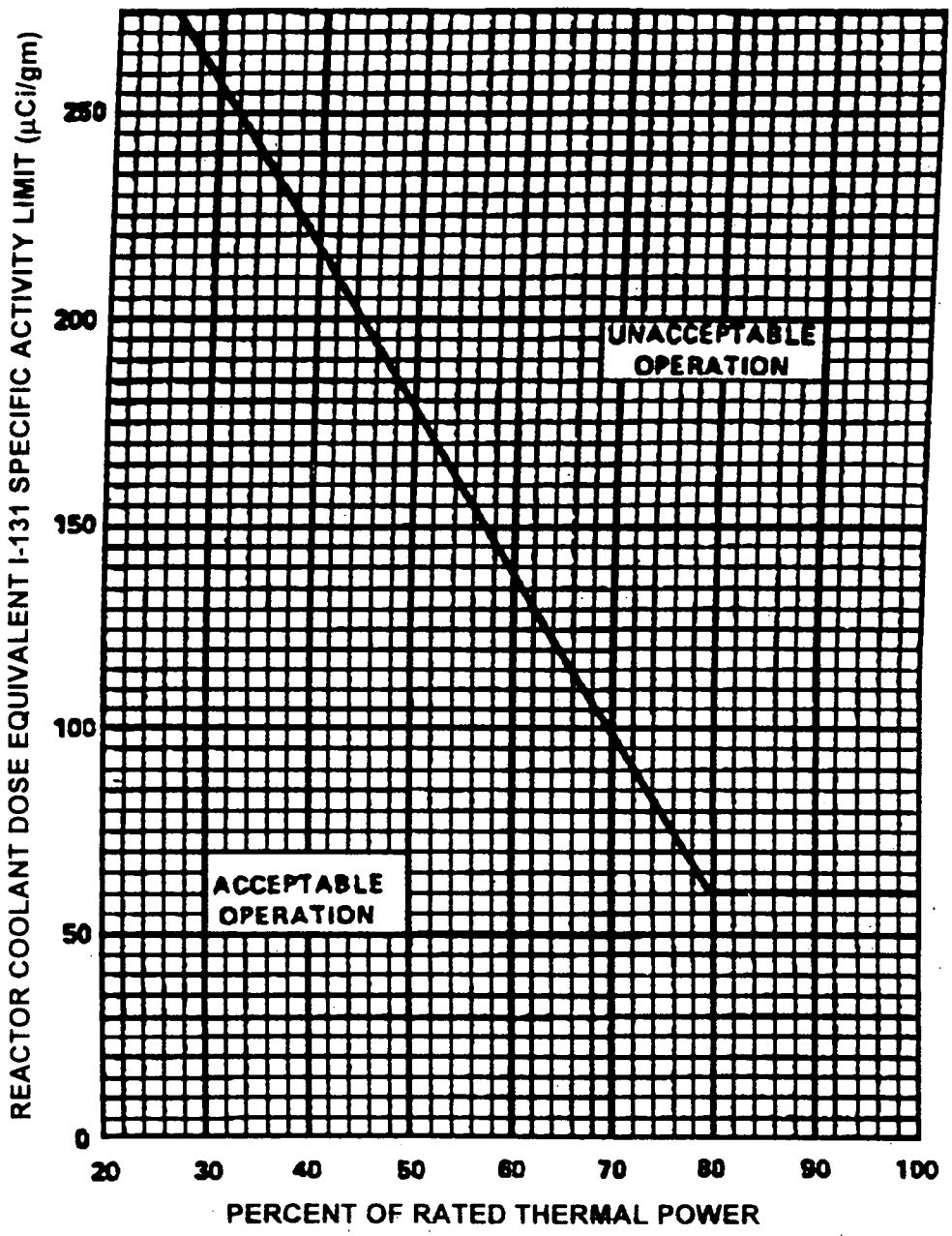


Figure 3.4.16-1
Reactor Coolant DOSE EQUIVALENT I-131 Specific Activity
Limit Versus Percent of RATED THERMAL POWER

62. Given the following plant conditions:

- Reactor startup in progress with the reactor critical
- Intermediate Range Channels N-35 and N-36 indicate 8.5E-11 and 9.2E-11 amps respectively

Which ONE (1) of the following describes the actions required if BOTH Source Range (SR) Instruments fail LOW in this situation?

A. Manually insert all control rods and shutdown bank B rods to shut down the reactor

B. Suspend operations involving positive reactivity additions.

C. Trip the reactor

D. Block the Source Range Reactor Trip and continue the startup

63. Given the following plant conditions:

- Unit 2 is experiencing a loss of all feedwater event and the operators have entered FRP-H.1, "Response to Loss of Secondary Heat Sink"

Which ONE (1) of the following describes why the operator is required to trip the RCPs prior to the initiation of feed and bleed?

A. Increase the feed and bleed rates

B. Limit heat addition to the RCS

C. Establish Natural Circulation Prior to rapid depressurization

D. Prevent damage to RCP seals during subsequent depressurization.

64. Given the following plant conditions:

- High radiation alarms have just been received from R-20 and R-30, Fuel Handling Building Lower Level
- The Inside Auxiliary Operator has been dispatched in accordance with AOP-005, Radiation Monitoring System
- The Inside Auxiliary Operator reports the following:

  WGDT "A" is at 70 psig and is in service
  WGDT "B" is at 20 psig and is in standby
  WGDT "C" is at 80 psig and is in cover gas
  WGDT "D" is at 60 psig with pressure slowly lowering

- AOP-009, Accidental Gas Release from a WGDT, has been entered

Which ONE (1) of the following describes the most appropriate action for these conditions?

A. Place WGDT "B" in service by depressing the manual override.

B. Initiate a gas release to the Plant Vent from WGDT "D".

C. Evacuate Containment and shift R-11 and R-12 to the Plant Vent.

D. Equalize WGDT "D" to WGDT "B".

65. Given the following plant conditions:

- A fuel handling accident has just occurred in the Spent Fuel Pit Area
- AOP-013, "Fuel Handling Accident", directs the Operator to determine if an unplanned release is in progress due to breached fuel

Which ONE (1) of the following describes the radiation monitor that indicates an unplanned release may be in progress if it is increasing or in alarm?

A. Check R-5, Spent Fuel Pit Area

B. Check R-11 and R-12, CV Air and Plant Vent

C. Check RI-14C, Plant Effluent Noble Gas-Low Range

D. Check R-21, Fuel Handling Building Upper Level

66. Given the following plant conditions:

- The unit was initially in a normal 100% power lineup
- An event occurs which results in a release of radioactivity to the environment

Which ONE (1) of the following describes the signals that could cause the Control Room Ventilation System to shift to the Emergency Pressurization Mode?

A. R-1, Control Room Area Monitor, in alarm OR a Safety Injection Signal

B. R-1, Control Room Area Monitor, in alarm OR Manual Actuation of Phase A Containment Isolation.

C. R-14C, Auxiliary Building Ventilation Stack Noble Gas Monitor, in alarm OR a Safety Injection Signal

D. R-14C, Auxiliary Building Ventilation Stack Noble Gas Monitor, in alarm OR Manual Actuation of Phase A Containment Isolation.

67. Given the following plant conditions:

- Unit 2 is at 30% power
- All control systems are in Automatic
- RCP "C" trips due to a faulty breaker

Which ONE (1) of the following describes what will **initially** happen to:

1. SG "C" pressure
2. SG "C" Narrow Range level
3. Loop 3 delta T (T_{hot} entering the S/G minus T_{cold} leaving the S/G)

2/27/98

A. Pressure will rise
Level will swell and then lower
Delta T will rise

B. Pressure will lower
Level will shrink and then rise
Delta T will rise

C. Pressure will lower
Level will shrink and then rise
Delta T will lower

D. Pressure will rise
Level will swell and then lower
Delta T will lower

68. Given the following plant conditions:

- The plant is operating at 100% power
- "A" AFW pump is out for maintenance - should be returned to service within 48 hours
- The outside AO reports a leak was discovered in the CST but the leak has been stopped
- Level is stable at 27%
- Repairs to the CST are estimated to take 36 hours

Which ONE (1) of the following correctly analyzes the status of the AFW System?

A. SDAFW and MDAFW Pump "B" are inoperable due to CST level being at 27%.

B. SDAFW and MDAFW Pump "B" are operable due to CST level being greater than the Technical Specification limit.

C. Only the SDAFW Pump is inoperable due to CST level being at 27%.

D. Only the MDAFW pump is inoperable due to CST level being at 27%.

69. Given the following plant conditions:

- The plant is in a normal 100% power lineup
- "A" Charging Pump is in service
- The following alarms are received:
  - APP-003-F4, CHG PMP HI SPEED
  - APP-003-E8, PZR CONTROL HI/LO LVL
  - APP-003-F8, PZR LO LVL HTR OFF & LTDN SECURE
- All other RCS parameters appear to be normal
- Assume that no other annunciators have actuated

Which ONE (1) of the following describes the most likely cause of this event?

A. The backup pressurizer level transmitter/controller has failed low

B. The controlling pressurizer level transmitter/controller has failed low

C. The backup pressurizer level transmitter/controller has failed high

D. The controlling pressurizer level transmitter/controller has failed high

70. Given the following plant conditions:

- The unit was initially at 100% power
- A Shutdown Bank "B" rod has fallen into the core
- A dropped rod recovery is in progress per AOP-001, "Malfunction of Reactor Control System, Section A, Dropped Rod"
- The APP-005-E2, ROD CONT SYSTEM URGENT FAILURE, alarm actuates just after recovery commences

Which ONE (1) of the following is the source of the urgent failure alarm and its affect on the Rod Control System?

A. Slave Cycler failure, all rod motion is inhibited

B. Slave Cycler failure, no affect on rod motion

C. Regulation failure, all rod motion is inhibited

D. Regulation failure, no affect on rod motion

71. Given the following plant conditions:

- The plant is in Mode 5 on RHR cooling
- RCS Temperature is 175°F
- The RCS is vented to atmosphere
- Pressurizer level is 12%
- The running RHR pump trips
- It is noted that RCS level is slowly decreasing
- AOP-020, "Loss of Residual Heat Removal (Shutdown Cooling)" is entered and the following valves are closed per the procedure:

  RHR-750, Loop 2 Hot Leg To RHR System
  RHR-751, Loop 2 Hot Leg To RHR System
  RHR-744A, RHR Return To Cold Legs
  RHR-744B, RHR Return To Cold Legs
  HCV-142, RHR To Letdown Line

- After the valves listed above are closed, the reactor operator reports RCS level still slowly decreasing

Which ONE (1) of the following describes the conclusion that can be made based on the above information?

A. The leak is in the RCS.

B. The leak is in the RHR system.

C. The Charging System is not operating.

D. The RCS has been inadvertently aligned to the RWST.

72. Given the following plant conditions:

- The unit is initially at 100% power
- A failed PZR pressure channel has caused a PZR PORV to fail open
- RCS pressure decreased to 1900 psig

Which ONE (1) of the following describes the Reactor Protection System trip sepoint that will be affected by this plant transient and the basis for this RPS trip?

A. Overtemperature Δ T - ensures the design limit for DNBR is met.

B. Overtemperature Δ T - ensures that the allowable heat generation rate (kW/ft) is not exceeded.

C. Overpower Δ T - ensures the design limit for DNBR is met.

D. Overpower Δ T - ensures that the allowable heat generation rate (kW/ft) is not exceeded.

73. Given the following plant conditions:

- Plant cooldown is in progress IAW EPP-005, "Natural Circulation Cooldown"
- The cold leg cooldown rate is being maintained at 15°F/hour
- The RCS is 75°F subcooled

Which ONE (1) of the following describes the **minumum** HVAC equipment configuration to preclude formation of voids in the upper reactor vessel head?

A. Both HVH-9A and HVH-9B, Reactor Concrete Shield Cooling Fans

B. Either HVH-9A or HVH-9B, Reactor Concrete Shield Cooling Fan

C. Both HVH-5A and HVH-5B, CRDM Cooling Fans

D. Either HVH-5A or HVH-5B, CRDM Cooling Fan

74. Given the following plant conditions:

- The plant is operating at 100% power
- Containment air recirculation units, HVH-1, 2, 3 and 4 are running
- A loss of offsite power occurs WITHOUT causing a safety injection

Which ONE (1) of the following statements describes how an HVH unit is started once power is restored to E-1 and E-2?

A. Push the vibration Reset pushbutton to allow the fan to automatically start

B. Place the control switch in the START position to manually start the fan

C. Place the control switch in the STOP position, then to the STANDBY (MID) position to allow the fan to automatically start

D. Remove and reinstall the control power fuses, then place the control switch in the START position to manually start the fan

75. Given the following plant conditions:

- The plant is at 100% power
- A S/G safety valve fails open

Which ONE (1) of the following describes the effect on the plant?

A. Increase in steam demand and increase in reactor power, possible reactor trip

B. Increase in steam demand and decrease in Tavg, steam line high differential pressure SI signal will occur

C. Increase in reactor power and automatic rod insertion on bank "D"

D. Decrease in turbine loading and automatic rod insertion on bank "D"

76. Given the following plant conditions:

- The unit is initially in a normal 100% power lineup
- Charging Pump "C" is running in automatic
- Power to the startup transformer is lost
- A turbine runback to 70% power occurs

Which ONE (1) of the following best describes the response of the Charging Pump "C" ?

A. Continues to run, but the controller shifts to automatic 15 to 20 seconds after power is restored

B. The pump will trip and then is sequenced on after the Emergency Diesel Generator completes the blackout sequence

C. Continues to run, but the controller will fail to maximum speed due to a loss of instrument air

D. The pump will trip and then can be manually started after the Emergency Diesel Generator completes the blackout sequence

77. Given the following plant conditions:

- The plant was at 100% power
- A reactor trip and safety injection occurred due to a Large Break LOCA
- Containment pressure is 25 psig
- The operator noted that no Automatic actions associated with HI-HI Containment Pressure have actuated
- The operator performs a manual containment spray actuation

Which ONE (1) of the following describes a component that **will still need to be manually aligned** and the position it must be aligned to?

A. Containment Spray Additive Tank Discharge Valves, OPEN.

B. Containment Spray Pump Discharge Valves, OPEN

C. Main Steam Isolation Valves, CLOSE.

D. Main Steam Isolation Bypass Valves, CLOSE.

78. Given the following plant conditions:

- The unit is at 95% power
- A Control Power fuse blows on Power Range Nuclear Instrument Channel N-42

Which ONE (1) of the following describes the final power level and the mechanism by which it will be reduced?

A. A Reference runback to 65% power will occur.

B. A Limiter runback to 65% power will occur.

C. A Reference runback to 70% power will occur.

D. A Limiter runback to 70% power will occur.

79. Given the following plant conditions:

- The plant is in a normal 100% power lineup

Which ONE (1) of the following correctly describes the heat loads supplied by the Service Water System?

A. Containment Air Recirculation Units HVH 1-4 and Instrument Air Compressor "D"

B. Containment Air Recirculation Units HVH 1-4 and the Station Air Compressor

C. The SI Pump seal water heat exchanger and Instrument Air Compressor "D"

D. The SI Pump seal water heat exchanger and the Station Air Compressor

80. Given the following plant conditions:

- The unit is in a normal 100% power lineup

Which ONE (1) of the following describes how the Control Rod Drive Mechanisms (CRDMs) are cooled?

A. Air from the containment atmosphere is drawn through the CRDM cooling shroud by the CRDM Cooling Units which are supplied with Service Water

B. Air is first cooled by CRDM Cooling Units which are supplied with Component Cooling Water, then blown by the CRDM Cooling Unit fans through the CRDM cooling shroud

C. Air from the containment atmosphere is drawn through the CRDM cooling shroud by the CRDM Cooling Units which are supplied with Component Cooling Water

D. Air is first cooled by CRDM Cooling Units which are supplied with Service Water, then blown by the CRDM Cooling Unit fans through the CRDM cooling shroud

81. Given the following plant conditions:

- The plant is being shutdown because of high vibrations on Condensate Pump "A"
- The plant is currently at 64% power
- Two Main Feedwater Pumps, two Condensate Pumps and a Heater Drain Tank Pump are in service
- Condensate Pump "A" trips

Which ONE (1) of the following describes the expected plant response with no operator action?

A. Both Main Feedwater Pumps will trip resulting in a Reactor trip due to low Steam Generator level.

B. One Main Feedwater Pump will trip but sufficient Feedwater flow exists to maintain Steam Generator level.

C. One Main Feedwater Pump will trip which may result in insufficient Feedwater flow to maintain Steam Generator level.

D. An automatic turbine runback will occur bringing Steam flow in-line with Feedwater flow.

82. Given the following plant conditions:

- At 09:55:00, the reactor was manually tripped due to PZR pressure decreasing in an uncontrolled manner
- At 10:03:00, Safety Injection was manually initiated, RCS pressure was at 1760 psig
- At 10:03:50, the CRSS directed the RO to reset Phase "A" Containment Isolation, RCS pressure was at 1720 psig

Which ONE (1) of the following describes the proper sequence of operation and plant response?

The RO should . . .

A. reset Phase "A" at 1004. ESF components will not return to the positions held prior to the actuation signal.

B. reset Phase "A" at 1005. ESF components will return to the positions held prior to the actuation signal.

C. reset SI, then reset Phase "A" at 1004. ESF components will return to the positions held prior to the actuation signal.

D. reset SI, then reset Phase "A" at 1005. ESF components will not return to the positions held prior to the actuation signal.

83. Given the following plant conditions:

- The unit is initially in a normal 100% power lineup
- The turbine trips due to a loss of Condenser Vacuum

Which ONE (1) of the following describes the turbine control system signals which will cause a trip signal to be sent to the Reactor Protection System?

A. 1/3 63AST relays < 45 psig OR 2/4 governor valves closed

B. 2/3 63AST relays < 45 psig OR 4/4 governor valves closed

C. 1/3 63AST relays < 45 psig OR 1/2 stop valves closed

D. 2/3 63AST relays < 45 psig OR 2/2 stop valves closed

84. Given the following plant conditions:

- A reactor startup is in progress
- Bank "D" is at 30 steps
- A Bank "D" rod drops to the bottom of the core

Which ONE (1) of the following describes the expected plant response?

A. A turbine runback occurs and rod withdrawal is blocked.

B. The rod bottom light for the affected rod illuminates and rod withdrawal is blocked.

C. A turbine runback occurs and the "ROD BOTTOM ROD DROP" annunciator will alarm.

D. The rod bottom light for the affected rod illuminates and the "ROD BOTTOM ROD DROP" annunciator will alarm.

85. Given the following plant conditions:

- The unit is in a normal 100% power lineup.
- All plant equipment is operable.
- Chemistry technician reports Spray Additive System confirmed sample results: NaOH solution concentration is 29% by weight.
- The Inside AO reports Spray Additive Tank level is 42%

Which ONE (1) of the following describes the condition of the Spray Additive Tank?

The Spray Additive Tank is :

A. Within Technical Specification Limit for concentration but not for level. The basis for these limits is to ensure a pH level between 8.5 and 11.0 in the Containment Sump.

B. Within the Technical Specification Limit for level but not for concentration. The basis for this limit is to offset the effect of the Boric Acid to ensure a neutral pH level between 6.5 and 8.5 in the Containment Sump.

C. Within the Technical Specification Limit for level but not for concentration. The basis for this limit is to ensure a pH level between 8.5 and 11.0 in the Containment Sump.

D. Within Technical Specification Limit for concentration but not for level. The basis for this limit is is to offset the effect of the Boric Acid to ensure a neutral pH level between 6.5 and 8.5 in the Containment Sump.

86. Given the following plant conditions:

- The unit was at 100% power
- A Reactor Trip and Loss of All AC Power have occurred
- EPP-1, Loss of All AC Power, was entered and AC Power has been restored

Which ONE (1) of the following describes how the battery chargers will be restarted after AC power is restored?

A. The chargers automatically start as soon as power is restored to the bus

B. The chargers are manually started as soon as possible

C. The chargers automatically start when the battery voltage reaches the low voltage setpoint

D. The chargers are manually started only after the battery voltage reaches the low voltage setpoint

87. Given the following plant conditions:

- Fuel handing evolutions are in progress inside containment
- You are the Control Operator stationed in the Control Room
- The Superintendent - Shift Operations (SSO) is on a tour
- The Refueling SRO reports that a fuel assembly was accidently dropped from the manipulator crane and has landed on top of the core area
- CV Noble Gas Radiation Monitor R-12 reading is increasing
- CV Particulate Radiation Monitor R-11 reading is stable

Which ONE (1) of the following describes the actions you should take based on the given plant conditions?

A. Depress and hold the CV EVACUATION HORN button for 15 seconds AND place HVE-3 and HVE-4 control switches in the Prepurge position

B. Depress and hold the CV EVACUATION HORN button for 15 seconds AND place HVE-3 and HVE-4 control switches in the Dome Vent position

C. Place and Hold the EVACUATION ALARM switch in the LOCAL position for 15 sec AND place HVE-3 and HVE-4 control switches in the Prepurge position

D. Place and Hold the EVACUATION ALARM switch in the LOCAL position for 15 sec AND place HVE-3 and HVE-4 control switches in the Dome Vent position

88. Given the following plant conditions:

- The unit is at 100% power
- The turbine trips due to a plant transient

Which ONE (1) of the following describes the automatic breaker actions that occur approximately one minute after the turbine is tripped?

Main Generator Output Breakers 52/8 and 52/9 open . . .

A. 4KV supply breakers to bus 3 and 4 (52/17 and 52/20) close
4KV supply breakers to bus 1 and 2 (52/7 and 52/12) open

B. 4KV supply breakers to bus 1 and 4 (52/7 and 52/20) open
4KV supply breakers to bus 2 and 3 (52/12 and 52/17) close

C. 4KV supply breakers to bus 3 and 4 (52/7 and 52/20) open
4KV tie breaker to bus 2 (52/10) and 4KV tie breaker to bus 4 (52/19) close

D. 4KV supply breakers to bus 1 and 4 (52/7 and 52/20) open
4KV supply breaker to bus 2 (52/12) and 4KV tie breaker to bus 4 (52/19) close

89. Given the following plant conditions:

- The unit has been tripped for over two minutes
- A loss of offsite power just occurred
- EDG "A" and "B" are powering E-1 and E-2

Which ONE (1) of the following describes the air compressors available under these conditions?

A. Instrument Air Compressor "D" and the Primary Air Compressor

B. Instrument Air Compressor "D" and the Station Air Compressor

C. Primary Air Compressor and Station Air Compressor

D. Instrument Air Compressor "A" and Instrument Air Compressor "B"

90. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- Lake Robinson temperature is 96°F

Which ONE (1) of the following describes the Containment Temperature limit (120°F) and its basis?

A. Based on average air temperature and ensures that the initial conditions assumed in the DBA analysis are not exceeded.

B. Based on average air temperature and protects safety related equipment inside the Containment during normal power operation.

C. Based on maximum air temperature and ensures that the initial conditions assumed in the DBA analysis are not exceeded.

D. Based on maximum air temperature and protects safety related equipment inside the Containment during normal power operation.

91. Given the following plant conditions:

- Reactor power is at 100%
- Pressurizer back up heater group B is selected to ON
- Pressurizer spray valves have just started to automatically open
- The Pressurizer Pressure Controller, PC-444J, is placed in MANUAL and the output is raised to 100%

Which ONE (1) of the following will be the immediate response of the system?

A. PCV-455C opens and spray valves fully open

B. PCV-455C opens and all pressurizer heaters energize

C. PCV-456 opens and spray valves fully open

D. PCV-456 opens and all pressurizer heaters deenergize

92. Given the following plant conditions:

- The unit is at 95% power
- APP-005-F4, PR LOWER CH HI FLUX DEV/AUTO DEFEAT, alarms
- Power Range Detector Currents are as follows [normalizing detector currents]:

	Upper	Lower
N-41	145 [147.4]	152 [152.6]
N-42	146 [147.4]	151 [152.6]
N-43	142 [147.4]	142 [152.6]
N-44	147 [147.4]	149 [152.6]

Which ONE (1) of the following describes the correct value of QPTR which is used as a basis for determining the required action and maximum value of reactor power allowed? (Attachment from FMP-007 included to assist in calculations)

A. 1.013, reduce reactor power to 91%

B. 1.013, maintain reactor power at 95%

C. 1.024, reduce reactor power to 92%

D. 1.024, reduce reactor power to 87%

ATTACHMENT 10.2
Page 1 of 1
MANUAL QPTR CALCULATIONS

This revision is the latest revision available and has been verified against NRCS.

_____(Print) _____ _____
Name Signature Date

Channel	Indicated Detector Currents		Normalizing Detector Currents		Normalized Detector Ratio	
	Upper	Lower	Upper	Lower	Upper	Lower
N41						
N42						
N43						
N44						
Average Normalized Detector Ratio =						

Upper QPTR = _____ / _____ = _____
Max Normalized Ratio Avg Normalized Ratio

Lower QPTR = _____ / _____ = _____
Max Normalized Ratio Avg Normalized Ratio

Maximum QPTR = _____ Power Level = _____

Performed By: _____ Date: _____ Time: _____
Comments: _____

Channel	Indicated Detector Currents		Normalizing Detector Currents		Normalized Detector Ratio	
	Upper	Lower	Upper	Lower	Upper	Lower
N41						
N42						
N43						
N44						
Average Normalized Detector Ratio =						

Upper QPTR = _____ / _____ = _____
Max Normalized Ratio Avg Normalized Ratio

Lower QPTR = _____ / _____ = _____
Max Normalized Ratio Avg Normalized Ratio

Maximum QPTR = _____ Power Level = _____

Performed By: _____ Date: _____ Time: _____
Comments: _____

SSO Review: _____ Date: _____

93. Given the following plant conditions:

- A Large Break LOCA has occurred
- 11 hours have elapsed since the LOCA began
- The operating crew has transitioned to EPP-10, Transfer to Long Term Recirculation

Which ONE (1) of the following explains the basis for aligning the ECCS system for long term recirculation?

A. Provides reduced heat removal due to the exponential decrease in decay heat

B. Prevents boron precipitation from the boric acid solution which could hinder core cooling

C. Prevents the generation of hydrogen from the zircaloy-water reaction.

D. Secures Containment Spray since it is no longer needed to reduce the iodine concentration in the CV atmosphere.

94. Given the following plant conditions:

- Unit 2 was at 100% power when a loss of one MFP occurred
- The operators decided to manually trip the reactor based on S/G levels
- Reactor trip breakers failed to open from the RTGB
- The operators entered Path-1, could not verify that the reactor was tripped, and immediately transitioned to FRP-S.1, "Response to Nuclear Power Generation/ATWS"

Which ONE (1) of the following describes why the main turbine is tripped during all ATWS conditions?

A. To help maintain a heat sink

B. To insert negative reactivity due to power defect

C. To ensure DNBR limits are not exceeded

D. To prevent excessive cooldown of the RCS

95. Given the following plant conditions:

- A LOCA inside Containment has occurred
- S/G "B" has been identified as ruptured
- All RPS and ESF systems responded as designed
- RCS Tcold is 519°F
- RCS Pressure has equalized with "B" S/G
- Containment Pressure is 4.3 psig
- The crew is progressing through PATH-2 making preparations for the initial RCS cooldown

Which ONE (1) of the following describes the required core exit temperature? Use the attached table to make your determination.

A. 450°F

B. 430°F

C. 415°F

D. 395°F

DETERMINE REQURIED CORE EXIT TEMPERATURE	
RUPTURED S/G PRESS (PSIG)	REQUIRED CORE EXIT TEMP. (° F)
GREATER THAN 1000	490 [470]
900 - 1000	480 [460]
800 - 899	465 [445]
700 - 799	450 [430]
600 - 699	435 [415]
500 - 599	415 [395]
400 - 499	395 [375]
300 - 399	365 [345]
250 - 299	340 [320]

96. Given the following plant conditions:

- While taking logs you record a reading of 50 inches for Hotwell level
- The log sheet calls for a max of 56 inches and a min of 52 inches and references an Engineering Recommendation

Which ONE (1) of the following describes the appropriate actions to take in accordance with OMM-001-11, Logkeeping?

A. Hotwell level should be raised to with limits and reentered after properly lining out the old reading

B. Immediately notify the Superintendent Shift Operations and the on-call Engineering Supervisor

C. Circle the reading, inform the CRSS and provide an explanation in the comments section of the log

D. Circle the reading, increase monitoring frequency and log Hotwell level every 2 hours

97. Given the following plant conditions:

- Unit 2 is in Mode 3 making preparations for a plant cooldown
- RCP "B" and "C" are operating
- RCP "A" was recently secured
- An individual touring containment reports that RCP "A" is slowly rotating in reverse

Which ONE (1) of the following describes the condition of RCP "A" and what would happen if the operator started RCP "A" while it was slowly rotating in reverse?

A. The discharge check valve on RCP "A" has stuck open. RCP "A" should be started immediately or serious RCP seal damage may result.

B. The anti-reverse rotation device on RCP "A" has failed. RCP "A" should be started immediately or serious RCP seal damage may result.

C. The discharge check valve on RCP "A" has stuck open. RCP "A" should not be started because it will draw excessive starting current, and may trip on overcurrent.

D. The anti-reverse rotation device on RCP "A" has failed. RCP "A" should not be started because it will draw excessive starting current, and may trip on overcurrent.

98. Given the following plant conditions:

- A throttle valve is to be set 6 turns open from the full closed position
- Independent Verification is required
- The operator sent to position the valve will also be conducting OJT with a new trainee who is accompanying him.

Which ONE (1) of the following describes how to verify the position of this valve in accordance with PLP-030, "Independent Verification"?

A. Have the Trainee position the valve and the Operator concurrently verify the correct position.

B. Have the Operator position the valve and then have the Trainee independently verify the correct position at a different time.

C. The Operator or Trainee should position the valve and another Operator should independently verify the position at a different time.

D. The Operator or Trainee should position the valve and another Operator should concurrently verify position.

99. Given the following plant conditions:

- A fire has occurred in the control room
- DSP-002, "Hot Shutdown Using the Dedicated Shutdown System", has been implemented
- Service Water Pump "D" power source has been shifted to the DS bus

Which ONE (1) of the following correctly describes how Service Water Pump "D" will be started?

A. Automatically by the presence of a manually initiated SI signal

B. Automatically by the blackout sequencer

C. Locally at the Charging Pump Room Control Panel

D. Locally at the Component Cooling Water Pump Control Panel

100. Given the following plant conditions:

- A fire is in progress within the facility
- DSP-002, "Hot Shutdown Using the Dedicated/Alternate System", is implemented

Which ONE (1) of the following describes how Natural Circulation Conditions are established and maintained by the Turbine Building Operator using the appropriate DSP attachment?

A. Allow the steam line safety valves to lift.

B. Use nitrogen from the Steam Dump Nitrogen System to operate the Steam Line PORVs.

C. Adjust Steam Driven Auxliliary Feed Water (SDAFW) Pump Discharge Flow Control Valve, FCV-6416, to control S/G levels.

D. Adjust SDAFW Pump steam inlet valve to control S/G levels.

Test Name: RO.TST
Test Date: Tuesday, February 03, 1998

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	1	ICCM-09	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	2	AOP-003-03	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	3	NI-09	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	4	ESF-09	012	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	5	SFP-05	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	6	EPP-001-03	007	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	7	AOP-020-08	005	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	8	FP-001-02	002	MC-SR	1	C	C	C	C	C	C	C	C	C	C
1:	9	PZR-RPS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	10	SW-09	003	MC-SR	1	B	B	B	B	B	B	B	B	B	B
1:	11	FP-09	001	MC-SR	1	B	B	B	B	B	B	B	B	B	B
1:	12	EPP-001-05	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	13	SG-14	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	14	EPP-001-04	006	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	15	AOP-018-03	003	MC-SR	1	D	C	D	A	B	A	C	B	D	A
1:	16	EPP-008-03	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	17	SD-10	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	18	AOP-005-03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	19	RHR-04	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	20	EDG-NEW	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	21	AOP-018-03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	22	RM-13	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	23	AOP-018-NEW	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	24	AOP-014-03	003	MC-SR	1	C	B	C	C	D	D	A	D	B	A
1:	25	AOP-010-05	007	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	26	CVCS-14	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	27	PZR-14	006	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	28	EDG	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	29	FOLDOUT-A	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	30	SI-06	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	31	CVCS-04	004	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	32	GP-003-ITS	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	33	EPP-001-06	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	34	AFW-10	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	35	ESF-04	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	36	AFW-10	010	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	37	CVCS-14	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	38	CVCS-BORON-NEW	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	39	PATH-1-04	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	40	DC-14	001	MC-SR	1	B	B	B	B	B	B	B	B	B	B
1:	41	RM-09	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	42	PZR-14	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	43	SG-11	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	44	AOP-019-03	007	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	45	EPP-001-03	010	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	46	CCW-09	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	47	SUPPLEMENT E	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	48	AOP-024-05	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	49	AOP-004-03	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	50	FRP-H.1-03	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C

Test Name: RO.TST
Test Date: Tuesday, February 03, 1998

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	51	FP-001-06	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	52	EPTSC-04-04	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	53	ESF-SEQ-NEW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	54	NGGC-1301-NEW	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	55	OMM-015-NEW	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	56	NI-10	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	57	ESF-04	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	58	PZR-14	011	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	59	PATH-1-03	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	60	TS-2.1	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	61	AOP-005-03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	62	NI-12	005	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	63	FRP-H.1-03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	64	AOP-009-08	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	65	AOP-013-03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	66	RM-08	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	67	SG-10	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	68	AFW-09	005	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	69	PZR-14	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	70	RDCNT-08	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	71	AOP-020-09	005	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	72	RPS-07	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	73	EPP-005-03	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	74	CVHVAC-09	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	75	MSS-14	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	76	CVCS-06	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	77	ESF-09	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	78	NI-14	005	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	79	SW-03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	80	CVHVAC-05	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	81	AOP-010-03	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	82	ESF-07	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	83	MT-11	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	84	RPI-09	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	85	TS-3.6.7	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	86	DC-10	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	87	AOP-013-03	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	88	KVAC-10	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	89	AIR-NEW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	90	CV-ITS	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	91	PZR-14	008	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	92	FMP-007-03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	93	PATH-1-03	012	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	94	FRP-S.1-05	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	95	PATH-2-03	008	MC-SR	1	B	B	B	B	B	B	B	B	B	B
1:	96	OMM-001-11-03	002	MC-SR	1	C	C	A	B	D	C	A	B	D	D
1:	97	RCS-10	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	98	PLP-030-06	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	99	SW-07	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	100	DSP-002-05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C

Robinson 98-300
Master SRO
February 23-27, 1998

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information	
Name:	Region: II
Date:	Facility/Unit: H. B. Robinson
License Level: SRO	Reactor Type: W
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected four hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results	
Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

ENCLOSURE 3

1. Given the following plant conditions:

   - Unit 2 is in cold shutdown
   - RCS is filled and there is a bubble in the PZR
   - RCS temperature is 190°F
   - RCS pressure is 385 psig
   - SUBCOOL T/C (Train A) is 255°F
   - SUBCOOL T/C (Train B) is 22°F

   Which ONE (1) of the following explains the above given indications?

   A. Loop 2 WR RTD failed high

   B. WR pressure transmitter PT-511AA failed low

   C. WR pressure transmitter PT-511BA failed low

   D. Loop 3 WR RTD failed high

2. Given the following plant conditions:

- The plant is operating at 100% power
- "B" Charging Pump is running
- CVC-200A, LTDN ORIFICE 45 GPM, is open
- The reactor operator notes the following
  - LT-115, VCT Level Transmitter, reads 24 inches (ERFIS)
  - LT-112, VCT Level Transmitter, reads 60 inches (ERFIS)

Which ONE (1) of the following describes the expected plant response assuming no operator actions?

A. LCV-115A, VCT/HLDP TK DIV, initially realigns to the VCT to prevent eventually losing charging pump suction.

B. LCV-115A, VCT/HLDP TK DIV, initially realigns to the CVCS HUTs and charging pump suction eventually shifts to the RWST.

C. VCT level will increase due to continuous auto makeup to the point of lifting the relief on the VCT.

D. VCT level will initially decrease and then level will be maintained by auto makeup.

3. Given the following plant conditions:

- The reactor has tripped
- Compensating voltage on N-35, Intermediate Range NI, is set too high

Which ONE (1) of the following describes the response of Intermediate Range Channel N-35 to the improperly set compensating voltage?

A. Indicates HIGH; preventing P-6 from automatically energizing the Source Ranges

B. Indicates LOW; causing P-6 to energize the Source Ranges prematurely

C. Indicates HIGH; the Source Range will be energized when P-6 is satisfied by the other IR channel (N-36)

D. Indicates LOW; the Source Range will be energized when P-6 is satisfied by the other IR channel (N-36)

4. Given the following plant conditions:

- The unit is initially in a normal 100% power lineup
- An electrical fault occurs which results in a loss of power to Instrument Bus 3

Which ONE (1) of the following describes the impact that the loss of Instrument Bus 3 has on the automatic operation of the Engineered Safeguards Actuation System?

A. Neither train of the Engineered Safeguards Actuation System is affected

B. The sequencers will not be able to automatically start any train "B" Engineered Safeguards Loads

C. The sequencers will not be able to automatically start any train "A" Engineered Safeguards Loads

D. The sequencers will not be able to automatically start any train "A" or "B" Engineered Safeguards Loads

5. Given the following plant conditions:

- A Refueling Outage is in progress
- The core has been offloaded to the Spent Fuel Pit
- There is a leak in the Spent Fuel Pit liner
- The Inside AO is making up to the Spent Fuel Pit with Primary Water to maintain level
- Primary Water is currently the only available source of makeup water to the Spent Fuel Pit

Which ONE (1) of the following describes the expected reactivity condition if the Spent Fuel Pit continues to be filled with Primary Water and the leak is not isolated?

A. K_{eff} may exceed 0.95 for fuel in both the normal fuel racks and high density racks.

B. K_{eff} would remain less than or equal to 0.95 for fuel in both the normal fuel racks and high density racks.

C. K_{eff} would remain less than or equal to 0.95 for fuel in the normal fuel racks but may exceed 0.95 for fuel in the high density racks.

D. K_{eff} would remain less than or equal to 0.95 for fuel in the high density fuel racks but may exceed 0.95 for fuel in the normal fuel racks.

6. Given the following plant conditions;

- The unit has tripped from a normal 100% power lineup
- A loss of offsite power has occurred
- Both Emergency Diesel Generators have failed to start.
- The Startup Transformer cannot be reenergized
- It has been decided to implement EPP-025, "Energizing Supplemental Plant Equipment Using the DSDG"
- The desired source of power is BACKFEED

Which ONE (1) of the following correctly describes the flowpath through the major components used to deliver power to in-plant loads using this BACKFEED alignment?

A. 230 KV Switchyard, Breaker 52/9, Auxiliary Transformer, Main Transformer, 4 KV Bus 2

B. 115 KV Switchyard, Startup Transformer, 4 KV Bus 2

C. 115 KV Switchyard, Startup Transformer, 4 KV Bus 1

D. 230 KV Switchyard, Breaker 52/8, Main Transformer, Auxiliary Transformer, 4 KV Bus 1

7. Given the following plant conditions:

- Unit 2 is in mid loop operation to repair a S/G primary manway leak
- S/G "A" primary manways are removed
- The RCS is vented by two hot leg vents
- RCS level is -68" and rising very slowly
- RHR pump "A" is in service at 3500 gpm
- The operator notices that RHR flow and pressure are oscillating

Which ONE (1) of the following describes the appropriate operator actions to stabilize RHR flow and pressure?

A. Raise RCS level to -50 inches and stabilize RCS level

B. Stop RHR Pump "A", then start RHR Pump "B"

C. Lower RHR pump "A" flow and increase RCS level

D. Raise RHR flow to 4500 gpm and increase RCS level

8. Given the following plant conditions:

- A reactor startup is in progress following a refueling outage
- An automatic preaction sprinkler actuation has occurred for Containment Fire Zone 26

Which ONE (1) of the following describes the required actions IAW FP-001, "Fire Emergency"?

A. Dispatch as a minimum the Fire Brigade Team Leader to the fire zone to investigate.

B. Dispatch as a minimum the Fire Protection Technical Aide to the fire zone to investigate.

C. Sound the fire alarm and announce the location of the fire on the plant P.A. system.

D. Sound the fire alarm, dispatch the Fire Brigade and immediately contact the Hartsville Fire Department.

9. Given the following plant conditions:

- The unit is operating at 15% power
- The operations crew is performing a plant shutdown per GP-006, "Normal Plant Shutdown From Power Operation to Hot Shutdown"

Which ONE (1) of the following describes the reactor trip associated with pressurizer level?

A. Hi level trip must be manually blocked when the P-7 interlock is satisfied

B. Hi and Lo level trips must be manually blocked when the P-10 interlock is satisfied

C. Hi level trip is automatically blocked when the P-7 interlock is satisfied

D. Hi and Lo level trips are automatically blocked when the P-10 interlock is satisfied

10. Given the following plant conditions:

- A Service Water header break has occurred
- A Manual Reactor and Turbine trip is initiated
- Just prior to the plant trip, PT-1684, SW South Header, indicated 35 psig and PT-1616, SW North Header indicated 29 psig

Which ONE (1) of the following describes the expected response of the Service Water System after the trip if SW pressures remain the same?

A. V6-16A, Turbine Bldg S Header Isol will remain open, V6-16B, Turbine Bldg N Header Isol, will close, V6-16C, Turbine Bldg SW Isol, will remain open

B. V6-16A, Turbine Bldg S Header Isol will remain open, V6-16B, Turbine Bldg N Header Isol, will close, V6-16C, Turbine Bldg SW Isol, will close

C. V6-16A, Turbine Bldg S Header Isol, will close, V6-16B, Turbine Bldg N Header Isol, will remain open, V6-16C, Turbine Bldg SW Isol, will remain open

D. V6-16A, Turbine Bldg S Header Isol, will close, V6-16B, Turbine Bldg N Header Isol, will close, V6-16C, Turbine Bldg SW Isol, will close

11. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- The Fire Alarm Console (FAC) has the following alarms:
  - ZN-7 Fire Alm. TRN-A Aux. Feedwater Pump Room
  - ZN-7 Fire Alm. TRN-B Aux. Feedwater Pump Room
  - ZN-NO Fire Alm. TRN-NO M.D. Fire Pump Brkr. Trbl.
- The Fire Brigade has responded to a fire reported in the Motor Driven Auxiliary Feedwater Pump Room

Which ONE (1) of the following describes the status of the Fire Protection Water Pumps?

A. The Engine Driven Fire Pump has failed to start at 100 psig fire water header pressure, the Motor Driven Fire Pump Started when fire water header pressure dropped below 90 psig for greater than 2 seconds.

B. The Motor Driven Fire Pump has failed to start at 100 psig fire water header pressure, the Engine Driven fire pump started when fire water header pressure dropped below 90 psig for greater than 2 seconds.

C. The Jockey pump has tripped, the Motor Driven Fire Pump started when fire water header pressure dropped below 100 psig for greater than 2 seconds.

D. The Jockey pump has tripped, the Engine Driven Fire Pump started at 100 psig fire water header pressure

12. Given the following plant conditions:

- A loss of all AC power has occurred
- The direction has been given to depressurize the intact steam generators at the maximum rate to 240 psig or until RCS cold leg temperature is less than 320°F

Which ONE (1) of the following describes the basis for the limits during steam generator depressurization?

A. Both limits are based on PTS concerns

B. Both limits are based on nitrogen injection concerns

C. The steam generator limit is based on nitrogen injection, the RCS temperature limit is based on PTS concerns

D. The steam generator limit is based on PTS concerns, the RCS temperature limit is based on nitrogen injection

13. Given the following plant conditions:

- The unit is at 100% power
- LT-486, S/G "B" Water Level input to S/G Water Level Control has just failed low
- No Operator action is taken

Which ONE (1) of the following describes the plant response to this event?

The affected S/G level will.....

A. decrease until a LO-LO Level trip occurs.

B. increase until a FW Isolation and a turbine trip occurs.

C. increase until the flow error signal off-sets the level error signal.

D. decrease until the flow error signal off-sets the level error signal.

14. Given the following plant conditions:

- A loss of all AC power has occurred
- EPP-1, Loss of All AC Power, is in use
- An AO has been directed to complete Attachment 2, Load Shed Listing, to minimize DC loads

What ONE (1) of the following describes the status of Instrument Busses 2 and 3 following completion of Attachment 2?

A. Instrument Bus 2 and Instrument Bus 3 are de-energized

B. Instrument Bus 2 is energized with selected IB 2 loads being supplied, but Instrument Bus 3 is de-energized

C. Instrument Buses 2 and 3 are energized with all IB 2 & 3 loads being supplied

D. Instrument buses 2 and 3 are energized with selected IB 2 & 3 loads being supplied

15. Given the following plant conditions:

- The unit is at 80% power
- A failure of the #1 seal on RCP "A" has occurred
- AOP-18, "Reactor Coolant Pump Abnormal Conditions", has been entered
- The reactor and RCP "A" have been tripped

Which ONE (1) of the following is the basis for the delay in closing CVC-303A, Seal Water Leakoff valve, after tripping RCP "A" ?

A. A 60 second delay is required to ensure that the RCP has sufficient coastdown time to be rotating less than 100 RPM

B. A 60 second delay is required to ensure that the RCP has sufficient coastdown time to come to a complete stop

C. A 180 second delay is required to ensure that the RCP has sufficient coastdown time to be rotating less than 100 RPM

D. A 180 second delay is required to ensure that the RCP has sufficient coastdown time to come to a complete stop

16. Given the following plant conditions:

- A recovery from a small break LOCA is in progress
- No RCP s are running
- EPP-008, Post-LOCA Cooldown and Depressurization, is in use
- Depressurization of the RCS has commenced
- Pressurizer level has just risen rapidly from off-scale low to 50%

Which ONE (1) of the following describes the cause of the rapid increase in pressurizer level?

Depressurization of the RCS. . .

A. has increased RHR and SI flow which is rapidly refilling the pressurizer

B. is causing voiding to occur in the reactor vessel head which is rapidly refilling the pressurizer

C. is causing increased pressurizer spray flow which is rapidly refilling the pressurizer

D. is causing voiding in the pressurizer level reference leg which is providing an indication of rapidly increasing pressurizer level

17. Given the following plant conditions:

- Unit 2 is at 80% power
- Tavg is 570°F
- Rod Control is in Manual
- All other controls are in Automatic
- The turbine runs back to about 44% power, causing a 15°F Tavg - Tref deviation

Which ONE (1) of the following describes condenser steam dump and Tave response for the above conditions? Assume no operator action.

A. Three steam dump valves will trip open
No steam dump valves will modulate open
Tavg will stabilize at 559°F

B. No steam dump valves will trip open
Five steam dump valves will modulate open
Tavg will stabilize at 564°F

C. Three steam dump valves will trip open
Two steam dumps valves will modulate open
Tavg will stabilize at 559°F

D. Three steam dump valves will trip open
Two steam dump valves will modulate open
Tavg will stabilize at 564°F

18. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- Annunciator APP-036-D8, PROCESS MONITOR HI RAD, alarms
- R-15, Condenser Vacuum Pump Discharge Monitor, is in alarm
- There is no evidence of short term spiking on R-15

Which ONE (1) of the following best describes the **NEXT** operator action to be taken based on these plant conditions?

A. Momentarily depress the ALARM/RESET pushbutton and see if the alarm returns.

B. Reduce power in preparation for identifying and isolating the affected SG.

C. Ensure that SG Blowdown is isolated to prevent contaminating the Blowdown Flash Tank.

D. Notify Chemistry to perform isotopic analysis of S/G samples for leak rate determination.

19. Given the following plant conditions:

- The unit is performing a plant cooldown using the RHR System
- RHR-FCV-605, "RHR Loop Flow Control" valve, fails closed

Which ONE (1) of the following describes the effect on total RHR flow and cooldown rate? Assume NO Operator action.

A. Total RHR flow will increase and cooldown rate will decrease

B. Total RHR flow will decrease and cooldown rate will increase

C. Total RHR flow will decrease and cooldown rate will decrease

D. Total RHR flow will increase and cooldown rate will increase

20. Given the following plant conditions:

- The unit is operating at 100% power
- EDG "B" was fully loaded for surveillance testing. EDG load has just been reduced to allow EDG cooldown
- Bus E-2 load is divided between EDG "B" and the normal power supply to E-2
- A loss of the normal power supply to E-2 occurs

Which ONE (1) of the following describes the effect this loss of offsite power will have on EDG "B" operation? (Assume no operator action)

A. The EDG output frequency will decrease as it picks up more load (KW).

B. The EDG output frequency will increase as its load (KW) decreases.

C. The EDG output frequency will decrease as its load (KW) decreases.

D. The EDG output frequency will increase as it picks up more load (KW).

21. Given the following plant conditions:

- The unit is operating at 100% power
- Charging Pump "A" is running in automatic
- Annunciator APP-003-F5, CHG PMP MOTOR OVLD/TRIP, alarms
- Annunciator APP-001-C2, RCP #1 SEAL LEAKOFF HI TEMP, alarms
- A few minutes later the RO notes the #1 seal leakoff temperatures for RCP "B" is approximately 250°F

Which ONE (1) of the following describes the appropriate actions based on these conditions?

A. Immediately start at least one charging pump to restore seal injection to all three RCPs

B. Immediately start at least one charging pump to restore seal injection to RCP "B"

C. Locally close the RCP seal water flow control valve for RCP "B" and start at least one charging pump to restore seal injection to the RCPs

D. Locally close the RCP seal water flow control valves for RCPs "A" and "C" and start at least one charging pump to restore seal injection to the RCPs

22. Given the following plant conditions:

- The unit is operating at 100% power
- WGDT "A" is being released
- Annunciator APP-036-E7, RAD MONITOR TROUBLE, alarms
- The R-14C, Plant Vent Monitor, FAIL alarm is illuminated

Which ONE (1) of the following describes the impact of these conditions on the waste gas release in progress and the appropriate crew actions necessary to make a subsequent release?

A. The release will continue and must be manually stopped. Subsequent waste gas releases may be performed provided R-12, CV or Plant Vent Radioactive Gas Monitor, is selected to plant vent.

B. The release will continue and must be manually stopped. Subsequent waste gas releases may be performed provided two samples are analyzed and two facility staff members verify the release rate calculations and the discharge line valving.

C. The release automatically stops. Subsequent waste gas releases may be performed provided R-12, CV or Plant Vent Radioactive Gas Monitor, is selected to plant vent.

D. The release automatically stops. Subsequent waste gas releases may be performed provided two samples are analyzed and two facility staff members verify the release rate calculations and the discharge line valving.

23. Given the following plant conditions:

- The unit is operating at 100% power
- At 0900, Annunciator APP-001-D2, RCP #1 SEAL LEAKOFF HI FLOW, alarms
- At 0901, the RO reports #1 seal leakoff is 5.2 gpm for RCP "A"
- At 0905, the RO reports #1 seal leakoff is 5.8 gpm for RCP "A", and #1 seal leakoff for RCP "B" and RCP "C" has lowered from 3.0 to 2.0 gpm

Which ONE (1) of the following describes the appropriate operator actions and the basis for their order?

A. Trip the Reactor, then trip RCP "A", to prevent challenging a safety function

B. Trip the Reactor, then trip RCP "A", to allow PATH-1 actions to be completed prior to entering AOP-018, Reactor Coolant Pump Abnormal Conditions

C. Trip RCP "A", then verify the Reactor is tripped, to avoid delaying the RCP trip in the event an ATWS occurs

D. Trip RCP "A", then verify the Reactor is tripped, to ensure the actions of AOP-018, Reactor Coolant Pump Abnormal Conditions, are completed prior to entry into PATH-1

24. Given the following plant conditions:

- The unit is at 100% power
- Annunciator APP-001-A4, CCW SURGE TK HI/LO LVL, alarms
- CCW Surge Tank Level is 40% and lowering slowly
- AOP-14, Component Cooling Water Malfunction, has been entered
- Makeup from primary water is now maintaining CCW surge tank level at 47%

Which ONE (1) of the following actions should be performed from the Control Room to identify whether or not a CCW leak exists inside Containment?

A. Isolate CCW to the Containment and monitor CV Water Level (White Sump Lights)

B. Isolate CCW to the Containment and monitor CCW Surge Tank level.

C. Monitor the RCPs for any increase in temperature and monitor CV Water Level (White Sump Lights).

D. Monitor the RCPs for any increase in temperature and monitor the Control Rod Drive Mechanisms for any increase in temperature.

25. Given the following plant conditions:

- The unit is holding power at a steady level
- A second Main Feedwater Pump has just been started as directed by OP-105, Manuevering the Plant When Greater Than 25% Power
- Condensate Pump "B" Trips

Which ONE (1) of the following describes immediate operator actions which must be performed under these conditions?

A. Place the Steam Dump Mode Switch in STEAM PRESS and initiate a Manual Turbine Runback from the EH TURBINE CONTROL Panel to less than or equal to 500MW

B. Place the Steam Dump Mode Switch in STEAM PRESS and Check Main Feedwater Pumps - PUMP TRIP INDICATED

C. Check Feedwater Regulating Valves - OPERATING PROPERLY IN AUTO and initiate a Manual Turbine Runback from the EH TURBINE CONTROL Panel to less than or equal to 500MW

D. Check Feedwater Regulating Valves - OPERATING PROPERLY IN AUTO and Check Main Feed Pumps - PUMP TRIP INDICATED

26. Given the following plant conditions:

- Unit 2 is at 100% power
- Normal letdown is in service
- Pressurizer level control is in automatic
- VCT relief valve leak causes pressure in VCT to lower

Which ONE (1) of the following describes the effect of lowering VCT pressure?

A. No.1 and No. 2 seal leakoff flow from the RCPs will increase

B. No.1 and No. 2 seal leakoff flow from the RCPs will decrease

C. No. 1 seal leakoff flow from RCPs will decrease and No. 2 seal leakoff flow from RCPs will increase

D. No. 1 seal leakoff flow from RCPs will increase and No. 2 seal leakoff flow from RCPs will decrease

27. Given the following plant conditions:

- Unit 2 is in hot shutdown and heating up to 547°F
- RCS temperature is 300°F
- RCS pressure is 385 psig
- Pressurizer PORV 455C cycles for no apparent reason, causing the high discharge temperature alarm to annunciate
- Afterwards, RCS pressure continues to slowly decrease
- PRT pressure is 3 psig and rising slowly
- After several minutes the tailpipe temperature indicator for PCV-455C is at 330°F and slowly rising

Which ONE (1) of the following is correct concerning the PORV tailpipe temperature reading?

A. Tailpipe temperature is reasonable for the conditions given and will continue to rise as PRT pressure slowly rises

B. Tailpipe temperature is inconsistent for the conditions given, a more likely value for a leaking PORV is somewhere around 220°F

C. Tailpipe temperature is inconsistent for the conditions given, a more likely value for a leaking PORV is somewhere around 445°F

D. Tailpipe temperature is reasonable for the conditions given and will remain constant as PRT pressure slowly rises

28. Given the following plant conditions:

- The unit was initially in a normal 100% power lineup
- Emergency Diesel Generator "A" is then started and paralleled to the E-1 Bus for surveillance testing

Which ONE (1) of the following describes the operation of the diesel generator voltage control knob while EDG "A" is operating in paralled with E-1?

A. Lowering the voltage control knob will cause the generator to pick up a larger share of the reactive load

B. Raising the voltage control knob will cause the generator to pick up a larger share of the reactive load

C. Raising the voltage control knob will cause the generator to pick up a larger share of the real load

D. Lowering the voltage control knob will cause the generator to pick up a larger share of the real load

29. Given the following plant conditions:

- A Reactor Trip and Safety Injection have occurred
- Containment pressure is 4.8 psig
- Core exit thermocouples indicate 557°F
- RCS Pressure is 1485 psig
- Both SI Pumps are running

Which ONE (1) of the following describes the appropriate operator action for these conditions and the basis for this action?

A. Maintain the RCPs running to provide heat removal through the break and the S/Gs.

B. Maintain the RCPs running to provide a two phase mixture above the break longer.

C. Trip the RCPs to prevent possible core uncovery if the RCPs are tripped later in the accident.

D. Trip the RCPs to prevent damage to the RCPs due to a loss of cooling water.

30. Given the following plant conditions:

- A Reactor Trip and Safety Injection have occurred
- A loss of offsite power has occurred
- EDG "A" has started and energized E-1
- EDG "B" failed to start, leaving E-2 deenergized

Which ONE (1) of the following describes which Safety Injection System valves **can be** operated from the RTGB under these conditions?

A. SI-870A, BIT Outlet Valve, SI-864A, RWST Discharge Valve, and SI-866A, Hot Leg Injection Valve

B. SI-870A, BIT Outlet Valve, SI-864A, RWST Discharge Valve, and SI-866B, Hot Leg Injection Valve

C. SI-870B, BIT Outlet Valve, SI-864B, RWST Discharge Valve, and SI-866A, Hot Leg Injection Valve

D. SI-870B, BIT Outlet Valve, SI-864B, RWST Discharge Valve, and SI-866B, Hot Leg Injection Valve

31. Given the following plant conditions:

- The unit at 100% power
- Letdown is isolated for maintenance on LCV-115A, "VCT/HOLDUP TANK DIVERSION"
- Excess letdown is in service
- Charging pump "A" is running in manual at minimum speed
- Seal injection flowrates are as follows:
  - RCP "A" 9 gpm
  - RCP "B" 5 gpm
  - RCP "C" 7 gpm

Which ONE (1) of the following describes the compliance of the current conditions with plant Technical Specifications and how seal injection flow must be adjusted as a result?

Seal Injection flow(s) on . . .

A. RCP "B" is below the Technical Specification limit. Throttle open on CVC-297B, the individual seal injection valve for RCP "B".

B. RCPs "B" and "C" are below the Technical Specification limit. Throttle open on CVC-297B and C, the individual seal injection valves for RCPs "B" and "C".

C. RCP "B" is below the Technical Specification limit. Throttle closed charging valve HCV-121 to increase seal injection flow, then throttle open on CVC-297B, the individual seal injection valve for RCP "B".

D. RCPs "B" and "C" are below the Technical Specification limit. Throttle closed charging valve HCV-121 to increase seal injection flow, then throttle open on CVC-297B and C, the individual seal injection valves for RCPs "B" and "C".

32. Given the following plant conditions:

- A reactor startup is in progress in accordance with GP-003, "Normal Plant Startup From Hot Shutdown to Critical"
- T_{avg} is 547°F
- All Control Rods are fully inserted

Which ONE (1) of the following correctly describes the latest time that Mode 2, "Startup" should be entered in accordance with GP-003?

A. Prior to withdrawing Shutdown Bank "A"

B. When Shutdown Bank "A" is greater than 20 steps

C. Prior to withdrawing Shutdown Bank "B"

D. When Shutdown Bank "B" is greater than 20 steps

33. Given the following plant conditions:

- The plant was operating at 100% power
- A reactor trip and loss of off-site power has occurred
- Emergency Busses E-1 and E-2 have been energized by the Emergency Diesel Generators

Which ONE (1) of the following describes the equipment which will be started by the Blackout Sequencer?

A. Charging Pump "B" and Auxiliary Feedwater Pump "A"

B. Charging Pump "B" and Service Water Pump "D"

C. Service Water Pump "A" and Service Water Pump "D"

D. Service Water Pump "A" and Auxiliary Feedwater Pump "A"

34. Given the following plant conditions:

- A Natural Circulation Cooldown is in progress
- CST level is 9%
- RCS temperature is 495°F
- AFW supply has been switched to the deepwell pumps
- The Steam Driven AFW Pump is out of service for maintenance
- Both Motor Driven AFW Pumps are running
- The Motor Driven AFW Pump Discharge Flow Control Valves, FIC-1424 and FIC-1425, have been set to 200 gpm EACH

Which ONE (1) of the following describes the requirements for the deepwell pumps?

A. Must have at least ONE deepwell pump running

B. Must have at least TWO deepwell pumps running

C. Must have at least THREE deepwell pumps running

D. The above flowrate exceeds the capacity of THREE deepwell pumps

35. Given the following plant conditions:

- RCS pressure is 1875 psig and decreasing
- Steam Generator pressures are:

  A = 400 psig and decreasing
  B = 980 psig
  C = 970 psig

- Tavg is 537°F and decreasing
- Steam Flows are:

  A = $1x10^6$ lbm/hr
  B = zero
  C = zero

Which ONE (1) of the following ESF signals will actuate Safety Injection at this time to provide protection under these conditions?

A. Low Pressurizer Pressure.

B. High Steamline Differential Pressure.

C. High Steam Line Flow with Low Tavg.

D. High Steam Line Flow with Low Steam Line Pressure.

36. Given the following plant conditions:

- An ATWS has occurred
- FRP-S.1 has been entered
- CV pressure has increased to 6.5 psig
- S/G levels are as follows:
  - "A" S/G Narrow Range level is 15%
  - "B" S/G Narrow Range level is 15%
  - "C" S/G Narrow Range level is 10%

Which ONE (1) of the following describes the MINIMUM amount of total Auxiliary Feedwater flow required to provide an adequate secondary heat sink?

A. No feedwater flow required

B. 300 gpm

C. 325 gpm

D. 600 gpm

37. Given the following plant conditions:

- RNP 2 is at 100% power
- Control bank "D" is at 200 steps
- Delta I is + 2% and stable
- All control systems are in automatic
- To compensate for fuel depletion the operator sets up and dilutes 20 gallons
- Due to a makeup control system malfunction, 500 gallons of water is added to the VCT
- In response to the malfunction, the operator drives control rods inward to maintain Tavg within 0.5°F of Tref

Which ONE (1) of the following describes the effects on, Delta I and Rod Insertion Limit after the rods are inserted and the plant is stabilized?

A. Delta I will rise (more positive)
Rod Insertion Limit will remain the same

B. Delta I will lower (less positive)
Rod Insertion Limit will lower

C. Delta I will lower (less positive)
Rod Insertion Limit will remain the same

D. Delta I will rise (more positive)
Rod Insertion Limit will lower

38. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- Annunciator APP-036-H2, "BA HEAT TRACE TROUBLE" has alarmed
- You dispatched an Auxiliary Operator (AO) to investigate the alarm
- The AO reports Number E5 B.A. FILTER heat tracing circuit is reading 148°F
- It has been determined that the low temperature is due to a malfunction of heat tracing and the backup heat tracing circuit is under clearance for repair

Which ONE (1) of the following explains the appropriate action to take in response to this situation and its basis?

A. Immediately establish flow through the system and determine if the affected boric acid flow path is still inoperable due to the inability to maintain boric acid in solution in the affected path.

B. Immediately have chemistry sample the affected flowpath and determine if the affected boric acid flow path is still inoperable due to the inability to maintain boric acid in solution in the affected path.

C. Immediately establish flow through the system and reduce the concentration in the Boric Acid Tanks to less than 2000 ppm.

D. Immediately have chemistry sample the affected flowpath and reduce the concentration in the Boric Acid Tanks to less than 2000 ppm.

39. Given the following plant conditions:

- The "B" and "C" S/Gs have completely blown down to the Containment and have no indicated level
- Containment Spray has automatically actuated
- RCS Subcooling is 58°F
- Operators are performing PATH-1 actions
- Charging Pumps "A" and "B" are running

Which ONE (1) of the following describes correct operator response to the above situation?

A. Trip the RCPs immediately based on Foldout "A" conditions.

B. Continue to run the RCPs since there is adequate seal injection flow.

C. Continue to run the RCPs until subcooling is less than 35°F.

D. Trip the RCPs immediately to protect them from overheating due to loss of cooling water

40. Given the following plant conditions:

- The unit is initially in a normal 100% power lineup
- At 0130, a reactor trip occurs
- At 0133, a loss of all AC Power occurs

Which ONE (1) of the following describes the design basis time that the safety related 125VDC Battery system is required to carry the vital loads following a loss of battery charger and the time by which compensatory action is required by procedure?

	Design Basis Time Limit	Procedural Time Limit
A.	0230	0200
B.	0233	0203
C.	0330	0230
D.	0333	0233

41. Given the following plant conditions:

- Unit 2 is at 100% power
- The following radiation monitors go into alarm:

  Condenser Air Ejector Gas Monitor R-15.

  Condensate Polisher Waste Effluent Monitor R-37.

  S/G Sample Radiation Monitor R-19A.

Which ONE (1) of the following describes the correct response to the above given conditions?

A. FCV-1933A and B, S/G A Blowdown Sample Isolation Valves REMAIN OPEN
RCV-10549, Condensate Polisher Discharge to Catch Basin CLOSES

B. FCV-1933A and B, S/G A Blowdown Sample Isolation Valves CLOSE
V1-31, Blowdown Isolation Valve to Catch Basin, CLOSES

C. FCV-1933A and B, S/G A Blowdown Sample Isolation Valves CLOSE
RCV-10549, Condensate Polisher Discharge to Catch Basin CLOSES

D. FCV-1933A and B, S/G A Blowdown Sample Isolation Valves REMAIN OPEN
V1-31, Blowdown Isolation Valve to Catch Basin, CLOSES

42. Given the following plant conditions:

- Pressurizer Level Control Transfer Switch, LM-459, is in "461 RPL 459" due to maintenance
- Pressurizer Level Transmitter LT-460 fails low

immediate or initial 2/27/98

Which ONE (1) of the following describes the response of the Pressurizer Level Control System with no operator action?

	Charging Pump Speed	Heaters Affected	Letdown Isolation
A.	Increase	Yes	Yes
B.	Increase	No	No
C.	Unaffected	No	No
D.	Unaffected	Yes	Yes

43. Given the following plant conditions:

- The unit is at 100% power
- Condensate Pump "A" trips

Assuming no operator action is taken, which ONE (1) of the following describes the S/G level and **minimum** number of channels required by design to initiate the first Reactor Trip signal?

A. S/G level < 16% on 1/3 channels from 2/3 S/Gs

B. S/G level < 16% on 1/2 channels from 1/3 S/Gs

C. S/G level < 30% on 1/2 channels from 1/3 S/Gs

D. S/G level < 30% on 1/3 channels from 2/3 S/Gs

44. Given the following plant conditions:

- The plant is at 25% power during power ascention after a forced outage
- Decreasing RCS pressure is annunciated and responded to by the operators
- AOP-019, Malfunction of RCS Pressure Control, has been entered
- Pressurizer spray valve, PCV-455B, is determined to be stuck partially open based on dual indication with a closed demand signal
- At 1015 the RO reports RCS pressure is 2010 psig and decreasing at 10 psig/min and an operator is dispatched to the containment to isolate the spray valve
- At 1030 the operator dispatched to containment reports he is ready to enter containment

Which ONE (1) of the following describes the appropriate crew response to these conditions?

A. Reduce power to less than 10%, then stop RCP "C" and implement applicable technical specifications

B. Stop RCP "C" and implement applicable technical specifications

C. Reduce power to less than 10%, then stop RCP "B" and implement applicable technical specifications

D. Stop RCP "B" and implement applicable technical specifications

45. Given the following plant conditions:

- The plant was operating at 100% power
- A reactor trip and loss of off-site power has occurred
- EPP-001 "Loss of All AC Power" has been entered
- EDG "A" is out of service for maintenance
- EDG "B" has failed to start
- An operator is dispatched to remove control power fuses for various E-1 and E-2 Loads

Which ONE (1) of the following describes the basis for removing the control power fuses under these conditions?

To defeat the automatic starting of . . .

A. the Charging Pumps to prevent thermal shock to the RCP seals

B. the Safety Injection Pumps to prevent exceeding PTS limits

C. large loads to prevent the possible overloading of E-1 and E-2

D. the Service Water Pumps to prevent overloading the EDGs

46. Given the following plant conditions:

- The plant was initially at 100% power with "B" CCW Pump running
- A Reactor Trip and Safety Injection have occurred
- The normal supply breakers to E-1 and E-2 have tripped on degraded voltage
- Power to E1 and E2 is being supplied by the EDGs

Which ONE (1) of the following describes the automatic action(s) associated with the Component Cooling Water (CCW) system for these conditions?

A. "A" and "B" CCW pumps will start.

B. "B" and "C" CCW pumps will start.

C. "A" CCW pump will start on low pressure if power is available to the Dedicated Shutdown bus

D. "C" CCW pump will start on low pressure if power is available to the Dedicated Shutdown bus.

47. Given the following plant conditions:

- Loss of ALL AC power has occurred
- EPP-001, "Loss of ALL AC Power", was entered and completed
- The plant is recovering using EPP-002 "Loss of ALL AC Power Recovery Without SI Required"

Which ONE (1) of the following describes indications which support the existence of natural circulation IAW Supplement E, "Natural Circulation Verification"?

A. Core Exit T/Cs DECREASING and RCS Hot Leg Temperature trending to saturation temperature for steam pressure

B. Core Exit T/Cs DECREASING and Steam Pressure DECREASING

C. RCS Cold Leg Temperature STABLE and RCS Hot Leg Temperature trending to saturation temperature for steam pressure

D. RCS Cold Leg Temperature STABLE and Steam Pressure DECREASING

48. Given the following plant conditions:

- The unit was initially in a normal 100% power lineup
- A loss of an instrument bus 9 has occurred
- AOP-24, "Loss of Instrument Bus" has been entered
- Instrument Bus 9 has just been reenergized

Which ONE (1) of the following describes the affect of restoring power to a manual/auto control station powered by Instrument Bus 9 if the controller was originally in the manual mode?

A. MAN light comes on for 15-20 seconds then goes out and controller shifts to automatic.

B. MAN light comes on but the controller may be shifted to automatic anytime.

C. AUTO light comes on but the controller may be returned to manual anytime.

D. AUTO light comes on for 15-20 seconds then goes out and controller shifts to manual.

49. Given the following plant conditions:

- A major oil fire at Unit 1 has caused the Unit 2 Control Room to fill with black smoke
- The Control Room has been evacuated in accordance with AOP-004, "Control Room Inaccessibility"
- The operators are attempting to maintain hot shutdown conditions
- RCS Hot Leg Temperature is 532°F
- RCS Cold Leg Temperature is 522°F
- RCS pressure is 905 psig

Which ONE (1) of the following describes the state of RCS?

A. Saturated

B. 3 °F Subcooled

C. 10 °F Subcooled

D. 13 °F Subcooled

50. Given the following plant conditions:

- The plant was initially at 100% power
- A Reactor Trip has occurred due to a loss of all Main Feedwater
- The operations crew has been unable to establish Auxiliary Feedwater to the Steam Generators
- A Pressurizer PORV has cycled several times causing the PRT to rupture
- Containment pressure is 2.5 psig and slowly increasing

Which ONE (1) of the following describes plant conditions for which RCS feed and bleed should be initiated?

A. Any one S/G level less than 26% wide range.

B. Any two S/G's level less than 26% wide range.

C. Any one S/G level less than 37% wide range.

D. Any two S/G's level less than 37% wide range.

51. Given the following plant conditions:

- The Unit is at 100% power
- Dual train fire alarm is received for the Unit 2 Cable Spreading Room
- Upon investigation it was determined that the installed fire suppression system in the Cable Spreading Room did not actuate

Which ONE (1) of the following would be primary backup means of extinguishing the fire?

A. Foam

B. High Velocity Fog Water Application

C. 150 pound Wheeled Halon

D. CO_2 from the E-1/E-2 Switchgear Room

52. Given the following plant conditions:

- A Site Area Emergency is declared
- An individual is injured and trapped in an 100 R/hr gamma radiation field

Which ONE (1) of the following represents the maximum planned stay time that an individual should be given in order to rescue the individual?

A. 6 minutes

B. 15 minutes

C. 45 minutes

D. 60 minutes

53. Given the following plant conditions:

- The unit was in a normal 100% power lineup
- A Large Break LOCA causes a Reactor Trip and Safety Injection at time 11:15:00
- Containment Pressure is 25 psig at time 11:15:03

Which ONE (1) of the following describes the correct order in which loads, if not previously running, will start?

A. SI Pumps, Containment Ventilation Fans (HVH-1 through 4), CV Spray Pumps

B. SI Pumps, CV Spray Pumps, Containment Ventilation Fans (HVH-1 through 4)

C. CV Spray Pumps, Containment Ventilation Fans (HVH-1 through 4), SI Pumps

D. CV Spray Pumps, SI Pumps, Containment Ventilation Fans (HVH-1 through 4)

54. Given the following plant conditions:

- Unit 2 is in Cold Shudown in preparation for Refueling
- Maintenance is planning to disassemble and inspect the SI Pump "C"
- A clearance is issued

Which ONE (1) of the following describes the proper sequence specified by OPS-NGGC-1301 for installing this clearance to prevent damage to equipment?

A. Shut and tag the pump discharge valve, shut and tag the pump suction valve, tag the pump's motor breaker open, place a tag or red cap on the control switch

B. Shut and tag the pump suction valve, shut and tag the pump discharge valve, place a tag or red cap on the control switch, tag the pump's motor breaker open

C. Place a tag or red cap on the control switch, tag the pump's motor breaker open, shut and tag the pump discharge valve, shut and tag the pump suction valve

D. Tag the pump's motor breaker open, place a tag or red cap on the control switch, shut and tag the pump suction valve, shut and tag the pump discharge valve

55. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- The stroke time for V2-16A, Aux Feedwater Header Discharge to S/G "A", is being measured in accordance with OST-201-1
- The acceptance criteria is 55 sec
- The valve took 57 sec to open as measured by the indicating lights on the RTGB
- The operator stationed at the valve measured a stroke time of 54 sec based strictly on stem travel

Which ONE (1) of the following describes the impact on valve operability and the appropriate actions to take?

A. The valve is still operable because the stroke time measured at the valve meets the acceptance criteria.

B. The valve is still operable. Exercise the valve until a stroke time, as measured by the indicating lights on the RTGB, that meets the acceptance criteria is obtained. If still unable to meet the criteria, then conduct an investigation.

C. Declare the valve inoperable. Perform an investigation to determine the reason for the test failure.

D. Declare the valve inoperable. Exercise the valve until a stroke time, as measured by the indicating lights on the RTGB, that meets the acceptance criteria is obtained. If still unable to meet the criteria, then conduct an investigation.

56. Given the following plant conditions:

- You have just completed OST-010 (Power Range Calorimetric During Power Operation) with the following results:

    1. Power Range Nuclear Instrument Readings
       *N-41: 97.3%
       *N-42: 99.5%
       *N-43: 99.4%
       *N-44: 101.6%

    2. Calculated power level: 99.5%

- The Nuclear Instrument Readings must be rounded off in accordance with the guidelines of OST-010.

Which ONE (1) of the following describes the appropriate actions to take based on these results?

A. Only N-41 is required to be adjusted to within 2% of calculated power to remain operable

B. Only N-44 is required to be adjusted to within 2% of calculated power to remain operable

C. N-41 and N-44 are required to be adjusted to within 2% of calculated power to remain operable

D. All Power Range channels are acceptable as specified by OST-010

57. Given the following plant conditions:

- A plant cooldown is in progress in accordance with GP-007, Plant Cooldown From Hot Shutdown to Cold Shutdown
- RCS Pressure is 1900 psig
- Tavg is 515°F
- Plant Cooldown has been initiated
- A RCS leak is identified in the CV

Which ONE (1) of the following describes the signals which will result in a Containment Ventilation Isolation under these conditions?

A. Low pressurizer pressure Safety Injection OR an alarm on R-12, Containment Noble Gas Monitor

B. Low pressurizer pressure Safety Injection OR an alarm on R-14C, Plant Effluent Noble Gas Monitor

C. Manual actuation of Containment Isolation Phase A OR an alarm on R-12, Containment Noble Gas Monitor

D. Manual actuation of Containment Isolation Phase A OR an alarm on R-14C, Plant Effluent Noble Gas Monitor

58. Given the following plant conditions:

- The plant is being cooled down for a refueling outage
- As RCS temperature and pressure are reduced, annunciator "PCV-455C LP PROT ACT/TROUB" comes in

Which ONE (1) of the following are potential reasons for this annunciator to be illuminated?

1. The LTOPP mode control switch is in NORMAL with the lowest RCS Cold Leg Temperature equal to 358°F
2. The LTOPP mode control switch is in LOW PRESSURE with RCS pressure equal to 425 psig and RCS temperature equal to 350°F
3. The LTOPP mode control switch is in LOW PRESSURE with the highest RCS Cold Leg Temperature equal to 368°F
4. The LTOPP mode control switch is in LOW PRESSURE with RC-536 PORV Block valve closed

A. 2, 3, 4

B. 1, 3, 4

C. 1, 2, 4

D. 1, 2, 3

59. Given the following plant conditions:

- The unit is at 75% for turbine valve testing
- An RCS leak has been identified
- AOP-016, Excessive Primary Plant Leakage, has been entered
- RCS Pressure is 1875 psig
- Tavg is 568°F
- Containment pressure is 3.8 psig
- PZR level is 9%

Which ONE (1) of the following describes the correct operator/plant response under these conditions and the basis for this response?

A. A manual reactor trip is required due to subcooling less than required, leak rate is greater than makeup capability

B. A manual reactor trip is required due to PZR level less than required, leak rate is greater than makeup capability

C. An automatic reactor trip should have occurred due to CV pressure, a manual reactor trip is necessary due to the failure of the Reactor Protection System

D. An automatic reactor trip should have occurred due to low RCS pressure, a manual reactor trip is necessary due to the failure of the Reactor Protection System

60. Given the following plant conditions:

- The unit is in Mode 3
- Both PORVs are inoperable due to maintenance
- A plant transient occurs and you observe the following indications
  - Highest cold leg temperature = 620 degrees F
  - RCS pressure = 2740 psig.

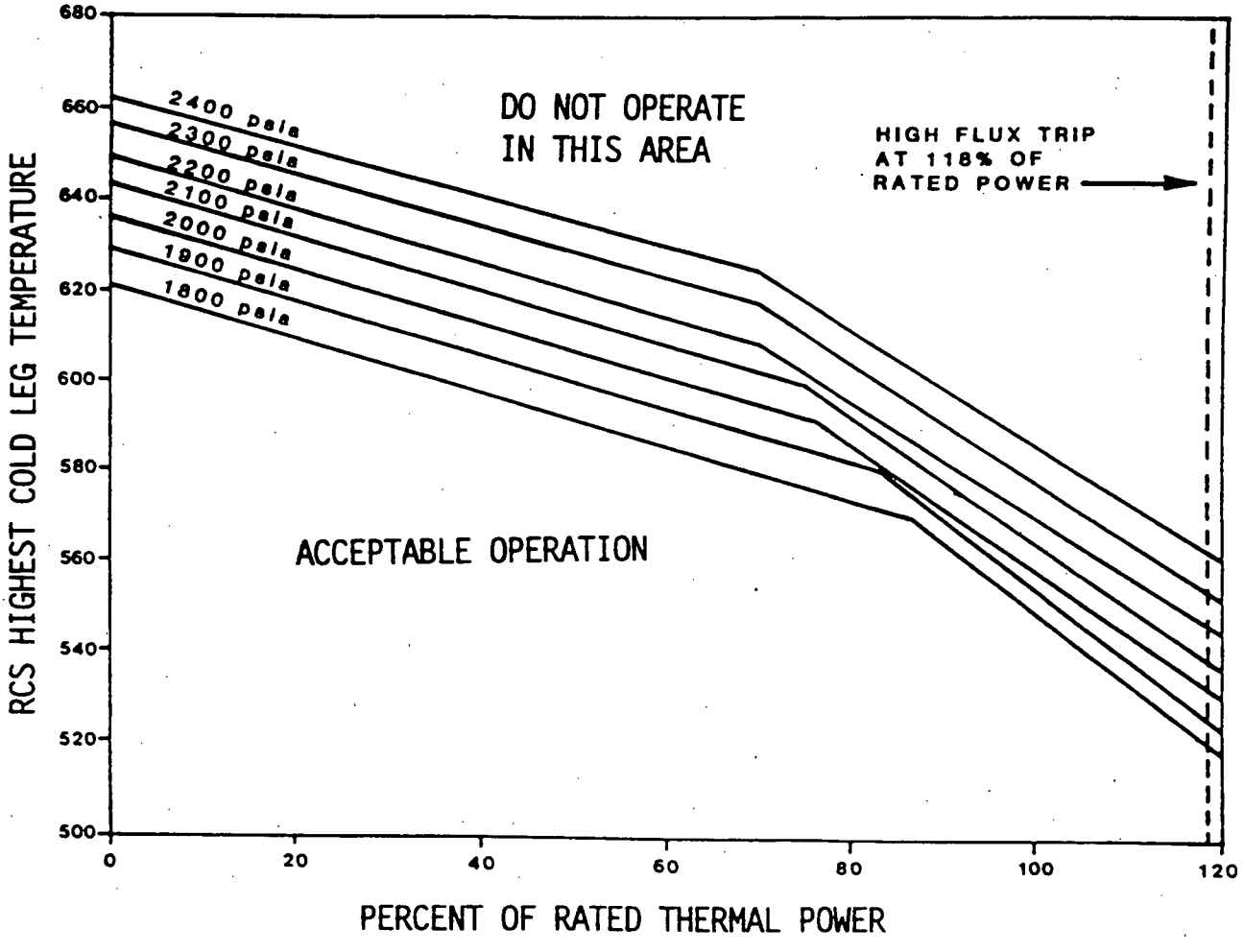
Which ONE (1) of the following describes the Safety Limits which have been violated? (Figure 2.1.1-1 provided)

A. No Safety Limits have been violated.

B. The RCS Pressure Safety Limit has been violated.

C. The combination of thermal power, highest cold leg temperature and RCS pressure Safety Limit has been violated.

D. Both Safety Limits have been violated.



NOTE: BASED ON A MINIMUM RCS FLOW OF 97.3×10^6 lbm/hr

Figure 2.1.1-1 (page 1 of 1)
Reactor Core Safety Limits

61. Given the following plant conditions:

- Unit 2 is stable at 68% after a dropped rod turbine runback
- The dropped rod has been recovered in accordance with AOP-001, Malfunction of the Reactor Control System
- The system dispatcher requests Robinson Unit 2 raise power to $\geq$ 90% due to system load
- The Chemistry Supervisor reported Dose Equivalent Iodine is 70 microcuries per gram after the power reduction

Which ONE (1) of the following describes the correct response to these conditions? (ITS Figure 3.4.16-1 provided)

A. Power can not be raised above the current level, Dose Equivalent Iodine must be restored to below the Technical Specification limit of 60 microcuries per gram within 48 hours.

B. Power can be raised to 80%, Dose Equivalent Iodine must be restored to below the Technical Specification limit of 60 microcuries per gram within 48 hours.

C. Power can be raised to 76%, Dose Equivalent Iodine must be restored to below the Technical Specification limit of 1 microcurie per gram within 48 hours.

D. Power can not be raised above the current level, Dose Equivalent Iodine must be restored to below the Technical Specification limit of 1 microcurie per gram within 48 hours.

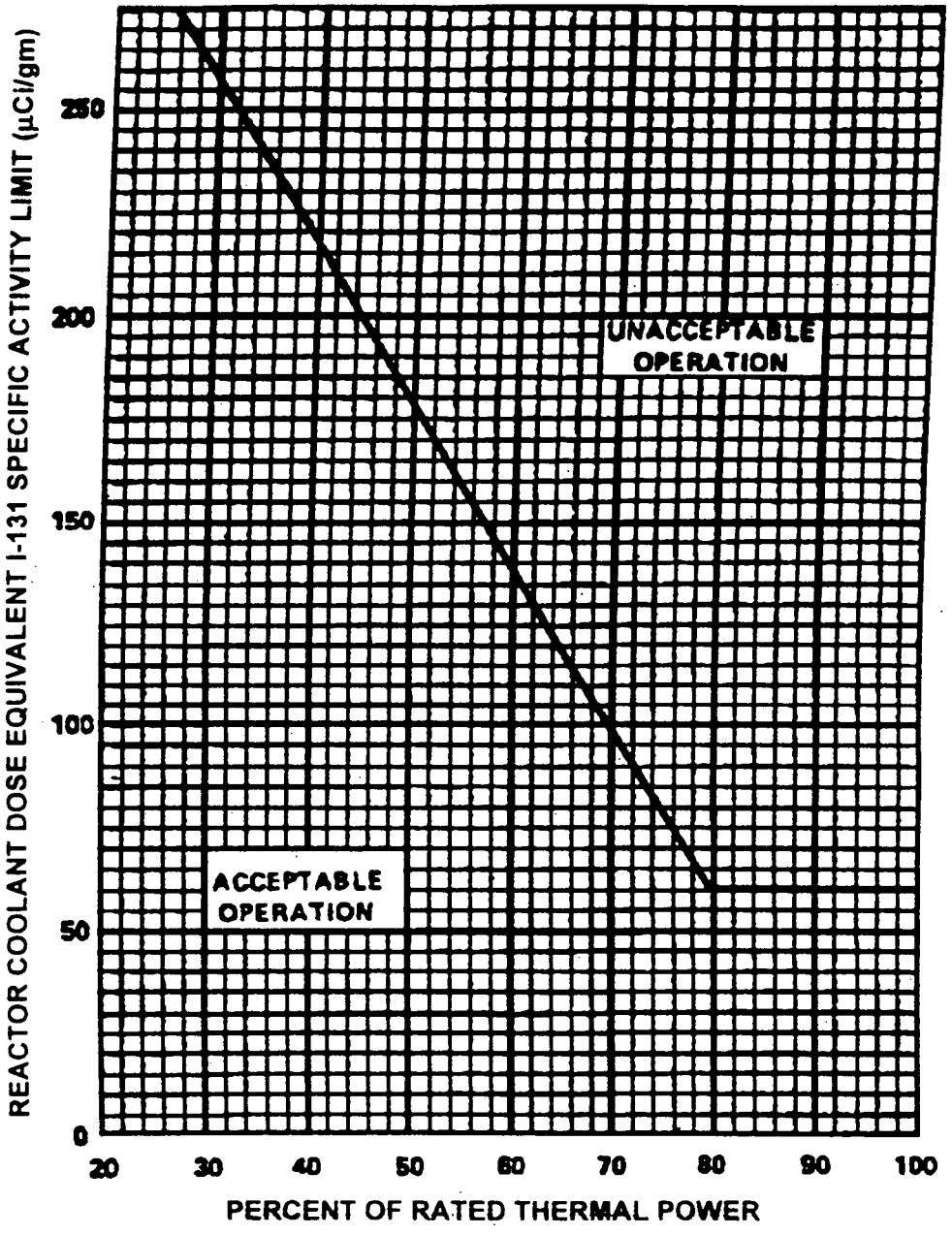


Figure 3.4.16-1
Reactor Coolant DOSE EQUIVALENT I-131 Specific Activity
Limit Versus Percent of RATED THERMAL POWER

62. Given the following plant conditions:

- Reactor startup in progress with the reactor critical
- Intermediate Range Channels N-35 and N-36 indicate 8.5E-11 and 9.2E-11 amps respectively

Which ONE (1) of the following describes the actions required if BOTH Source Range (SR) Instruments fail LOW in this situation?

A. Manually insert all control rods and shutdown bank B rods to shut down the reactor

B. Suspend operations involving positive reactivity additions.

C. Trip the reactor

D. Block the Source Range Reactor Trip and continue the startup

63. Given the following plant conditions:

- Unit 2 is experiencing a loss of all feedwater event and the operators have entered FRP-H.1, "Response to Loss of Secondary Heat Sink"

Which ONE (1) of the following describes why the operator is required to trip the RCPs prior to the initiation of feed and bleed?

A. Increase the feed and bleed rates

B. Limit heat addition to the RCS

C. Establish Natural Circulation Prior to rapid depressurization

D. Prevent damage to RCP seals during subsequent depressurization.

64. Given the following plant conditions:

- High radiation alarms have just been received from R-20 and R-30, Fuel Handling Building Lower Level
- The Inside Auxiliary Operator has been dispatched in accordance with AOP-005, Radiation Monitoring System
- The Inside Auxiliary Operator reports the following:

  WGDT "A" is at 70 psig and is in service
  WGDT "B" is at 20 psig and is in standby
  WGDT "C" is at 80 psig and is in cover gas
  WGDT "D" is at 60 psig with pressure slowly lowering

- AOP-009, Accidental Gas Release from a WGDT, has been entered

Which ONE (1) of the following describes the most appropriate action for these conditions?

A. Place WGDT "B" in service by depressing the manual override.

B. Initiate a gas release to the Plant Vent from WGDT "D".

C. Evacuate Containment and shift R-11 and R-12 to the Plant Vent.

D. Equalize WGDT "D" to WGDT "B".

65. Given the following plant conditions:

- A fuel handling accident has just occurred in the Spent Fuel Pit Area
- AOP-013, "Fuel Handling Accident", directs the Operator to determine if an unplanned release is in progress due to breached fuel

Which ONE (1) of the following describes the radiation monitor that indicates an unplanned release may be in progress if it is increasing or in alarm?

A. Check R-5, Spent Fuel Pit Area

B. Check R-11 and R-12, CV Air and Plant Vent

C. Check RI-14C, Plant Effluent Noble Gas-Low Range

D. Check R-21, Fuel Handling Building Upper Level

66. Given the following plant conditions:

- The unit was initially in a normal 100% power lineup
- An event occurs which results in a release of radioactivity to the environment

Which ONE (1) of the following describes the signals that could cause the Control Room Ventilation System to shift to the Emergency Pressurization Mode?

A. R-1, Control Room Area Monitor, in alarm OR a Safety Injection Signal

B. R-1, Control Room Area Monitor, in alarm OR Manual Actuation of Phase A Containment Isolation.

C. R-14C, Auxiliary Building Ventilation Stack Noble Gas Monitor, in alarm OR a Safety Injection Signal

D. R-14C, Auxiliary Building Ventilation Stack Noble Gas Monitor, in alarm OR Manual Actuation of Phase A Containment Isolation.

67. Given the following plant conditions:

- Unit 2 is at 30% power
- All control systems are in Automatic
- RCP "C" trips due to a faulty breaker

Which ONE (1) of the following describes what will **initially** happen to:

1. SG "C" pressure
2. SG "C" Narrow Range level 2/27/98
3. Loop 3 delta T (T_{hot} entering the S/G minus T_{cold} leaving the S/G)

A. Pressure will rise
Level will swell and then lower
Delta T will rise

B. Pressure will lower
Level will shrink and then rise
Delta T will rise

C. Pressure will lower
Level will shrink and then rise
Delta T will lower

D. Pressure will rise
Level will swell and then lower
Delta T will lower

68. Given the following plant conditions:

- The plant is operating at 100% power
- "A" AFW pump is out for maintenance - should be returned to service within 48 hours
- The outside AO reports a leak was discovered in the CST but the leak has been stopped
- Level is stable at 27%
- Repairs to the CST are estimated to take 36 hours

Which ONE (1) of the following correctly analyzes the status of the AFW System?

A. SDAFW and MDAFW Pump "B" are inoperable due to CST level being at 27%.

B. SDAFW and MDAFW Pump "B" are operable due to CST level being greater than the Technical Specification limit.

C. Only the SDAFW Pump is inoperable due to CST level being at 27%.

D. Only the MDAFW pump is inoperable due to CST level being at 27%.

69. Given the following plant conditions:

- The plant is in a normal 100% power lineup
- "A" Charging Pump is in service
- The following alarms are received:
  - APP-003-F4, CHG PMP HI SPEED
  - APP-003-E8, PZR CONTROL HI/LO LVL
  - APP-003-F8, PZR LO LVL HTR OFF & LTDN SECURE
- All other RCS parameters appear to be normal
- Assume that no other annunciators have actuated

Which ONE (1) of the following describes the most likely cause of this event?

A. The backup pressurizer level transmitter/controller has failed low

B. The controlling pressurizer level transmitter/controller has failed low

C. The backup pressurizer level transmitter/controller has failed high

D. The controlling pressurizer level transmitter/controller has failed high

70. Given the following plant conditions:

- The unit was initially at 100% power
- A Shutdown Bank "B" rod has fallen into the core
- A dropped rod recovery is in progress per AOP-001, "Malfunction of Reactor Control System, Section A, Dropped Rod"
- The APP-005-E2, ROD CONT SYSTEM URGENT FAILURE, alarm actuates just after recovery commences

Which ONE (1) of the following is the source of the urgent failure alarm and its affect on the Rod Control System?

A. Slave Cycler failure, all rod motion is inhibited

B. Slave Cycler failure, no affect on rod motion

C. Regulation failure, all rod motion is inhibited

D. Regulation failure, no affect on rod motion

71. Given the following plant conditions:

- The plant is in Mode 5 on RHR cooling
- RCS Temperature is 175°F
- The RCS is vented to atmosphere
- Pressurizer level is 12%
- The running RHR pump trips
- It is noted that RCS level is slowly decreasing
- AOP-020, "Loss of Residual Heat Removal (Shutdown Cooling)" is entered and the following valves are closed per the procedure:

  RHR-750, Loop 2 Hot Leg To RHR System
  RHR-751, Loop 2 Hot Leg To RHR System
  RHR-744A, RHR Return To Cold Legs
  RHR-744B, RHR Return To Cold Legs
  HCV-142, RHR To Letdown Line

- After the valves listed above are closed, the reactor operator reports RCS level still slowly decreasing

Which ONE (1) of the following describes the conclusion that can be made based on the above information?

A. The leak is in the RCS.

B. The leak is in the RHR system.

C. The Charging System is not operating.

D. The RCS has been inadvertently aligned to the RWST.

72. Given the following plant conditions:

- The unit is initially at 100% power
- A failed PZR pressure channel has caused a PZR PORV to fail open
- RCS pressure decreased to 1900 psig

Which ONE (1) of the following describes the Reactor Protection System trip sepoint that will be affected by this plant transient and the basis for this RPS trip?

A. Overtemperature Δ T - ensures the design limit for DNBR is met.

B. Overtemperature Δ T - ensures that the allowable heat generation rate (kW/ft) is not exceeded.

C. Overpower Δ T - ensures the design limit for DNBR is met.

D. Overpower Δ T - ensures that the allowable heat generation rate (kW/ft) is not exceeded.

73. Given the following plant conditions:

- Plant cooldown is in progress IAW EPP-005, "Natural Circulation Cooldown"
- The cold leg cooldown rate is being maintained at 15°F/hour
- The RCS is 75°F subcooled

Which ONE (1) of the following describes the **minumum** HVAC equipment configuration to preclude formation of voids in the upper reactor vessel head?

A. Both HVH-9A and HVH-9B, Reactor Concrete Shield Cooling Fans

B. Either HVH-9A or HVH-9B, Reactor Concrete Shield Cooling Fan

C. Both HVH-5A and HVH-5B, CRDM Cooling Fans

D. Either HVH-5A or HVH-5B, CRDM Cooling Fan

74. Given the following plant conditions:

- The plant is operating at 100% power
- Containment air recirculation units, HVH-1, 2, 3 and 4 are running
- A loss of offsite power occurs WITHOUT causing a safety injection

Which ONE (1) of the following statements describes how an HVH unit is started once power is restored to E-1 and E-2?

A. Push the vibration Reset pushbutton to allow the fan to automatically start

B. Place the control switch in the START position to manually start the fan

C. Place the control switch in the STOP position, then to the STANDBY (MID) position to allow the fan to automatically start

D. Remove and reinstall the control power fuses, then place the control switch in the START position to manually start the fan

75. Given the following plant conditions:

- The plant is at 100% power
- A S/G safety valve fails open

Which ONE (1) of the following describes the effect on the plant?

A. Increase in steam demand and increase in reactor power, possible reactor trip

B. Increase in steam demand and decrease in Tavg, steam line high differential pressure SI signal will occur

C. Increase in reactor power and automatic rod insertion on bank "D"

D. Decrease in turbine loading and automatic rod insertion on bank "D"

76. Given the following plant conditions:

- The operators are responding to a LOCA and are in EPP-009, "Transfer to Cold Leg Recirculation"
- The inside AO reports the critical steps of Attachment 1 are complete
- The following conditions exist:
  - * SI pump "A" running
  - * CV spray pump "A" running
  - * All other SI and CV spray pumps are off
- The RO reports RWST level at 8% and slowly decreasing

Which ONE (1) of the following operator actions is correct?

A. Stop "A" SI pump only

B. Stop "A" CV spray pump only and close its discharge valves

C. Stop the "A" SI pump, Stop "A" CV Spray pump, and Close the CV Spray Pump discharge valves

D. Leave the pumps in their current configuration and proceed rapidly through the procedure to establish recirculation

77. Given the following plant conditions:

- The unit is in a normal 100% power lineup
- Battery Charger "A" is supplying "A" Station Battery and its associated DC Bus Loads
- Annunciator APP-036-D1 "BATTERY A/A1 TROUBLE" has just alarmed
- You have dispatched an Auxiliary Operator (AO) to investigate
- The AO reports that the cause of the trouble alarm is a ground on the "A" DC Bus
- The AO reports that the suspected location of the ground is on the "A" Station Battery based on a visual inspection

Which ONE (1) of the following explains the appropriate operator actions under these conditions?

A. Continue to supply the "A" Battery with Battery Charger "A" because it is identfified in the Technical Specifications as the "preferred" charger

B. Place Battery Charger "A-1" in service because it is identfified in the Technical Specifications as the "preferred" charger

C. Continue to supply the "A" Battery with Battery Charger "A" because it the only charger capable of carrying the "A" DC Bus alone if it becomes necessary to disconnect the "A" Station Battery from the "A" DC Bus.

D. Place Battery Charger "A-1" in service because it the only charger capable of carrying the "A" DC Bus alone if it becomes necessary to disconnect the "A" Station Battery from the "A" DC Bus.

78. Given the following plant conditions:

- Draining the RCS to -65 inches for S/G manway removal is in progress
- Local Standpipe watch reports one standpipe is at -68" and the other is at -64"
- Both RTGB standpipe level indicators LI-403 and LI-404 indicate -63"

Which ONE (1) of the following describes the required actions?

A. Secure the drain-down, all standpipe level instrumentation must agree within 3 inches.

B. Secure the drain-down, the lowest indicated level can not go below -68 inches.

C. Continue the drain-down, need two of the four level indications below -65".

D. Continue the drain-down after holding RCS level constant for 5 minutes to allow levels to stabilize.

79. Given the following plant conditions:

- The unit has been synchronized to the grid in accordance with GP-005, "Power Operation"
- Three Power Range Nuclear Instrument Channels read approximately 11%, the fourth reads 9%
- Both of the turbine first stage pressure channels indicate approximately 35 psig

Which ONE (1) of the following describes the impact on the Reactor Protection System?

A. The P-7 permissive status light should be ON. The High PZR Pressure and RCP Undervoltage trips are blocked

B. The P-7 permissive status light should be OFF. The Low PZR Pressure and RCP Undervoltage trips are blocked

C. The P-7 permissive status light should be ON. The High PZR Pressure and RCP Undervoltage trips are NOT blocked

D. The P-7 permissive status light should be OFF. The Low PZR Pressure and RCP Undervoltage trips are NOT blocked

80. Given the following plant conditions:

- The unit is at 30% power
- Power increase to 100% is in progress
- Control Rods are in Manual
- After a rod withdrawal of several steps, the rods continue outward when the IN-HOLD-OUT lever is returned to the HOLD position

Which ONE (1) of the following is the correct IMMEDIATE Operator action IAW AOP-001, Malfunction of Reactor Control System, that should be performed next?

A. Place the ROD BANK SELECTOR switch in AUTO, and check for continued rod motion

B. Place the ROD BANK SELECTOR switch in Bank "D" and check for continued rod motion

C. Place the IN-HOLD-OUT switch to IN and check for continued rod motion

D. Manually initiate a reactor trip and enter PATH-1

81. Given the following plant conditions:

- Reactor Power is at 80% following a power escalation
- Bank "D" Step Counter is at 180 Steps
- The RO reports Bank "D" IRPI indicates as follows:

  100" 100" 112" 116" 116"

Which ONE (1) of the following describes the alignment condition of the Bank "D" rods and the appropriate crew response if actions are required?

A. Each rod is within 15 inches of the bank demand, no additional crew response is required.

B. Each rod is within 15 inches of the average of the individual rod positions in the bank, no additional crew response is required.

C. There is more than one rod greater than 7.5 inches out of alignment compared to the bank demand position. The unit must be placed in Mode 3 within 6 hours.

D. There is more than one rod greater than 7.5 inches out of alignment compared to the average of the individual rod positions in the bank. The unit must be placed in Mode 3 within 6 hours.

82. Given the following plant conditions:

- The unit was at or near 100% power for 390 days
- A turbine runback to 68% has just occurred
- Control Bank D rod H4 indicates 0 inches
- The rod bottom light for H4 is ON
- The step counter for Control Bank D is at 105 Steps
- AOP-001, Malfunction of Reactor Control System, has been entered

Which ONE (1) of the following describes the required action and its basis under these conditions ? Note: Plant Curve Book Provided

A. Rods are above the Technical Specification limit but below the LO-LO limit alarm. Borate to restore Control Rod Bank D above the insertion limits to ensure adequate Shutdown Margin is available.

B. Rods are above the Technical Specification limit but below the LO-LO limit alarm. Borate to allow rod withdrawal to return Axial Flux Difference to the normal band.

C. Rods are below the Technical Specification limit. Borate to restore Control Rod Bank D above the insertion limits to ensure adequate Shutdown Margin is available.

D. No rod insertion limit has been exceeded. Borate to allow rod withdrawal to return Axial Flux Difference to the normal band.

83. Given the following plant conditions:

- A Reactor Trip and Safety Injection have occurred
- As directed by PATH-1, you have transitioned to EPP-8, "Post LOCA Cooldown and Depressurization"
- Two SI Pumps are running
- Both RHR Pumps have been secured
- The crew has reached the step for SI pump reduction

Which ONE (1) of the following describes two conditions, that if both are met, allow you to secure an SI pump?

A. RCS Subcooling greater than required and adequate PZR level

B. RCS Subcooling greater than required and at least one Charging pump running

C. RCS Hot Leg temperatures low enough and adequate PZR level

D. RCS Hot Leg temperatures low enough and at least one Charging pump running

84. Given the following plant conditions:

- The unit was initially at 100% power
- A Reactor Trip and Safety Injection have occurred
- R-14C, Plant Effluent Noble Gas Monitor, is in alarm
- Area Radiation Monitor Readings in the Auxiliary Building are increasing
- The Crew has transitioned from PATH-1 to EPP-20, LOCA Outside Containment

Which ONE (1) of the following describes how to determine if the leak is located in the Cold Leg Injection Piping in accordance with EPP-20?

A. Close RHR-744A & B, RHR COLD LEG INJ Valves and monitor RCS pressure

B. Close RHR-744A & B, RHR COLD LEG INJ Valves and monitor PZR level

C. Close SI-870A & B, SI COLD LEG INJ Valves and monitor RCS pressure

D. Close SI-870A & B, SI COLD LEG INJ Valves and monitor PZR level

85. Given the following plant conditions:

- The reactor has tripped
- 2 control rods failed to insert on the trip
- The crew has transitioned to EPP-004, Reactor Trip Response

Which ONE (1) of the following describes the basis for determining the MINIMUM volume of boric acid that must be added to the RCS as a result of the stuck rods?

Borate to a . . .

A. Cold Shutdown Boron Concentration of $\geq$ 1.77% Δ k/k

B. Cold Shutdown Boron Concentration of $\geq$ 4.0% Δ k/k

C. Hot Shutdown Boron Concentration of $\geq$ 1.77% Δ k/k

D. Hot Shutdown Boron Concentration of $\geq$ 4.0% Δ k/k

86. Given the following plant conditions:

- The Unit is at 100% power
- CCW Heat Exchanger outlet temperature is 106°F and increasing slowly
- Lake Robinson temperature is 87°F
- Service Water Pressure is 35 psig
- The highest reading RCP Motor bearing temperature is 180°F and increasing slowly

Which ONE (1) of the following best describes the appropriate Operating Crew response?

A. Start standby Service Water Pump.

B. Trip the Reactor and stop the RCPs.

C. Reduce plant load.

D. Start standby CCW Pump.

87. Given the following plant conditions:

- Reactor power was initially 100%
- Reactor Coolant Pump "A" has tripped

Which ONE (1) of the following nuclear instrument indications would warrant entry into FRP-S.1, "Response To Nuclear Power Generation/ATWS"?

A. Intermediate range startup rate indicates 0.1 dpm

B. Power range indicates 3%

C. Source range startup rate is +0.3 dpm

D. Neither source range channel is energized and intermediate startup rate is -0.1 dpm

88. Given the following plant conditions:

- The unit is at 100% power
- A release of Waste Condensate Tank (WCT) "A" is in progress
- Annunciator APP-036, RAD MONITOR TROUBLE, alarms
- The BOP Operator reports that the FAIL light for R-18, Liquid Waste Disposal Monitor, is ON

Which ONE (1) of the following describes the plant response and appropriate operator actions for these conditions?

RCV-018, "Liquid Waste Release Isolation", . . .

A. remains open. Operator action must be taken to secure the liquid waste release.

B. remains open. No operator action is required since R-18 is still operable.

C. automatically closes. The release may be restarted provided two independent samples are first analyzed.

D. automatically closes. No liquid waste releases may be performed until R-18 is declared operable.

89. Given the following plant conditions:

- Unit is initially in a normal 100% power lineup
- Pressurizer PI-444 fails high.
- The operators respond per AOP-025 and stabilize the plant pressure at 1950 psig.
- Both PORVs indicate closed

Which ONE (1) of the following describes the appropriate actions to comply with Technical Specifications?

A. Close and remove power from associated block valve within one hour, restore RCS pressure to $\geq$ 2000 psig within 1 hours.

B. Close and maintain power to associated block valve within one hour, restore RCS pressure to $\geq$ 2000 psig within 2 hours.

C. Close and remove power from associated block valve within one hour, restore RCS pressure to $\geq$ 2205 psig within 1 hours.

D. Close and maintain power to associated block valve within one hour, restore RCS pressure to $\geq$ 2205 psig within 2 hours.

90. Given the following plant conditions:

- The unit is at 100% power.
- Chemistry reports the following results from a primary to secondary leakage rate determination:
  - "A" S/G leakage is 0.25 gpm.
  - "B" S/G leakage is 0.15 gpm
  - "C" S/G leakage is 0.10 gpm

Which ONE (1) of the following describes the actions required by Technical Specifications?

A. No primary to secondary leakage limits have been exceeded.

B. Total allowable primary to secondary leakage through all three S/Gs has been exceeded.

C. Primary to secondary leakage limit through a single S/G has been exceeded.

D. Both the total primary to secondary leakage through all three S/Gs limit and the primary to secondary leakage through a single S/G limit have been exceeded.

91. Given the following plant conditions:

- The plant was initially at 100% power
- A loss of off-site power and an SI signal occurred at 10:00:00
- The EDG's started at 10:00:00 and energized both Emergency Busses at 10:00:10
- The AFW pumps are checked at 10:00:30 and ONLY the SDAFW pump was running

Which ONE (1) of the following statements is correct for the present conditions?

A. The SI sequencer should have started the MDAFW Pumps 15 seconds ago

B. The SI sequencer will not start the MDAFW Pumps for another 19.5 seconds

C. The Blackout sequencer should have started the MDAFW Pumps 10 seconds ago

D. The Blackout sequencer will not start the MDAFW Pumps for another 9.5 seconds

92. Given the following plant conditions:

- RCS fill and vent evolution is in progress.
- An oncoming RTGB Control Operator is preparing to take the shift from the offgoing operator.

Which ONE (1) of the following describes the minimum required actions for turning over the Fill and Vent evolution in progress?

A. Management Designated Monitor approval is necessary to turn over the evolution that is still in progress.

B. Superintendent Shift Operations approval is necessary to turn over the evolution that is still in progress.

C. Turnover may proceed provided the oncoming and offgoing operators work in parallel on the evolution for a minimum of 30 minutes.

D. Turnover may proceed provided the oncoming and offgoing operators fully discuss the evolution and complete the applicable portion of the turnover sheet.

93. Given the following plant conditions:

- The unit is operating at 100% power
- Containment pressure is +0.9 psig
- CST level is 30,000 gal
- RWST level is 295,000 gal
- IVSW tank level is 70 gal

Which ONE (1) of the following actions would be required by Technical Specifications in order to continue operation at 100% power?

A. Restore Containment pressure to within limits within 1 hour.

B. Restore CST level to within limits within 6 hours.

C. Restore RWST level to within limits within 1 hour.

D. Restore IVSW tank level to within limits within 6 hours.

94. Given the following plant conditions:

- The unit is about to be synchronized to the grid in accordance with GP-005, Power Operation
- You have directed the STA to monitor and compare all indications of reactor power level

Which ONE (1) of the following describes how often these comparisons should be made and the action required if all indications do not agree?

Compare indications at least once . . .

A. every 3 hours, if not within 5% of each other stabilize reactor power and contact plant management for instructions.

B. every 3 hours, if not within 10% of each other trip the reactor and enter PATH-1.

C. per 10% power change, if not within 5% of each other stabilize reactor power and contact plant management for instructions.

D. per 10% power change, if not within 10% of each other trip the reactor and enter PATH-1.

95. Given the following plant conditions:

- Unit 2 is in Hot Shutdown
- An RCS cooldown and depressurization is in progress
- RCS temperature is 348°F
- Pressurizer pressure is 355 psig
- The following data was collected over the last two hour period:

RCS and Pressurizer Temperature (°F)

	0100	0115	0130	0145	0200	0215	0230	0245	0300
RCS	547	523	493	474	448	424	395	372	348
PZR	650	645	640	600	545	500	465	445	440

Which ONE (1) of the following correctly identifies any Technical Specification RCS and/or Pressurizer cooldown rate limits that have been violated?

A. No limits have been violated

B. The Pressurizer cooldown rate limit was violated

C. The RCS cooldown rate limit was violated

D. Both the RCS and Pressurizer cooldown rate limits were violated

96. Given the following plant conditions:

- While performing a surveillance on LT-460, I&C personnel discover at 1200 that the high level trip setpoint for that channel is 87.5%, which is outside the calibration tolerance band.
- The I&C personnel adjusted the LT-460 high level trip setpoint back to 91.0% at 1215 and completed the surveillance satisfactorily.
- They report the "as found" information to the I&C Supervisor who determines that the channel was inoperable in the "as found" condition.
- The I&C Supervisor notifies the SSO at 1230 of the inoperability of the channel in the "as found" condition.

Which ONE (1) of the following statements is correct in accordance with the plant Technical Specifications?

The channel should be considered:

A. Operable. An operability determination should be conducted to determine the total time the channel was inoperable.

B. Operable. An operability determination is not required.

C. NOT operable. The bistables associated with LT-460 must be placed in a tripped condition no later than 1800.

D. NOT operable. The bistables associated with LT-460 must be placed in a tripped condition no later than 1830.

97. Given the following plant conditions:

- Turbine Heat Soak is in progress in accordance with GP-005, Power Operation
- "A" SI Pump has been out of service for 48 hours for mechanical seal replacement
- "A" EDG oil sample results require placing the "A" EDG out of service

Which ONE (1) of the following situations will place the plant in a potentially high safety impact configuration? (Table 2 & 3 of OMM-048 Attachment 10.2 provided)

A. "A" EDG out of service for 120 hours and "A" SI Pump out of service for an additional 140 hours

B. "A" EDG out of service for 140 hours and "A" SI Pump out of service for an additional 185 hours

C. The combination of "A" EDG and "A" SI Pump out of service for an additional 140 hours.

D. The combination of "A" EDG and "A" SI Pump out of service for 185 hours.

PSA OF ON-LINE MAINTENANCE FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

Table 2. Matrix Showing Not Recommended Combinations

TRAIN A MATRIX

N - Not Recommended Based on 72 Hour Unavailability Time. Review Table 3 for Allowed Hours if UnavailabilityTime Will Be Less Than 72 Hours.

For Allowed Combinations, Review Table 3 If Planned Unavailability Time Exceeds 72 Hours.

		RPS CHANNEL A	RCS PZR PORV 456	RHR PUMP A	CVCS CHGP B	SI PUMP A	S/G A PORV RV-1	S/G B PORV RV-2	S/G C PORV RV-3	MFWP A	AFW MDP A	AFW SDP	SW PUMP A	SW PUMP B	CCW PUMP A	CCW PUMP B	EDG A	EMERGENCY BUS E1	DC BAT CHG A/A1	AIR COMP A	AIR COMP PRIM	FIRE PUMP DIESEL	DEEPWELL PUMP B
		1080	2005	2045	2060	2080	3020	3020	3020	3050	3065	3065	4060	4060	4080	4080	5095	5175	5235	6135	6135	6175	6270
RPS CHANNEL A	1080											N											
RCS PZR PORV 456	2005										N	N											
RHR PUMP A	2045						N	N	N		N	N											
CVCS CHGP B	2060																						
SI PUMP A	2080																						
S/G A PORV RV-1	3020			N							N	N											
S/G B PORV RV-2	3020			N							N	N											
S/G C PORV RV-3	3020			N							N	N											
MFWP A	3050										N	N											
AFW MDP A	3065		N	N			N	N	N	N		N									N		
AFW SDP	3065	N	N	N			N	N	N	N	N						N						
SW PUMP A	4060																						
SW PUMP B	4060																						
CCW PUMP A	4080															N							
CCW PUMP B	4080														N								
EDG A	5095											N											
EMERGENCY BUS E1	5175																						
DC BAT CHG A/A1	5235																						
AIR COMP A	6135																						
AIR COMP PRIM	6135										N												
FIRE PUMP DIESEL	6175																						
DEEPWELL PUMP B	6270																						

PSA OF ON-LINE MAINTENANCE FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

Table 2. Matrix Showing Not Recommended Combinations

TRAIN B MATRIX

N - Not Recommended Based on 72 Hour Unavailability Time. Review Table 3 for Allowed Hours if UnavailabilityTime Will Be Less Than 72 Hours.

For Allowed Combinations, Review Table 3 If Planned Unavailability Time Exceeds 72 Hours.

		RPS CHANNEL B	RCS PZR PORV 455C	RCS BLOCK VALVES	RHR PUMP B	CVCS CHGP A	CVCS CHGP C	SI PUMP C	MFWP B	AFW MDP B	SW PUMP C	SW PUMP D	CCW PUMP C	EDG B	DSDG	DS BUS	EMERGENCY BUS E2	DC BAT CHG B/B1	AIR COMP B	AIR COMP D	FIRE PUMP MOTOR	DEEPWELL PUMP A	DEEPWELL PUMP C
		1080	2005	2005	2045	2060	2060	2080	3050	3065	4060	4060	4080	5095	5098	5114	5175	5235	6135	6135	6175	6270	6270
RPS CHANNEL B	1080									N													
RCS PZR PORV 455C	2005																						
RCS BLOCK VALVES	2005																						
RHR PUMP B	2045									N													
CVCS CHGP A	2060																						
CVCS CHGP C	2060															N							
SI PUMP C	2080																						
MFWP B	3050									N													
AFW MDP B	3065		N		N				N		N	N		N		N				N			
SW PUMP C	4060									N		N		N							N		
SW PUMP D	4060									N	N			N							N		
CCW PUMP C	4080															N							
EDG B	5095									N	N	N			N	N							
DSDG	5098													N									
DS BUS	5114						N			N			N	N									
EMERGENCY BUS E2	5175																						
DC BAT CHG B/B1	5235																						
AIR COMP B	6135																						
AIR COMP D	6135									N													
FIRE PUMP MOTOR	6175										N	N											
DEEPWELL PUMP A	6270																						N
DEEPWELL PUMP C	6270																					N	

PSA OF ON-LINE MAINTENANCE FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

Table 2. Matrix Showing Not Recommended Combinations

TRAIN A BY TRAIN B MATRIX

N - Not Recommended Based on 72 Hour Unavailability Time. Review Table 3 for Allowed Hours if UnavailabilityTime Will Be Less Than 72 Hours.

For Allowed Combinations, Review Table 3 If Planned Unavailability Time Exceeds 72 Hours.

		RPS CHANNEL B	RCS PZR PORV 455C	RCS BLOCK VALVES	RHR PUMP B	CVCS CHGP A	CVCS CHGP C	SI PUMP C	MFWP B	AFW MDP B	SW PUMP C	SW PUMP D	CCW PUMP C	EDG B	DSDG	DS BUS	EMERGENCY BUS E2	DC BAT CHG B/B1	AIR COMP B	AIR COMP D	FIRE PUMP MOTOR	DEEPWELL PUMP A	DEEPWELL PUMP C
		1080	2005	2005	2045	2060	2060	2080	3050	3065	4060	4060	4080	5095	5098	5114	5175	5235	6135	6135	6175	6270	6270
RPS CHANNEL A	1080																						
RCS PZR PORV 456	2005									N													
RHR PUMP A	2045				N					N				N									
CVCS CHGP B	2060																						
SI PUMP A	2080							N						N									
S/G A PORV RV-1	3020				N			N		N	N	N		N									
S/G B PORV RV-2	3020				N			N		N	N	N		N									
S/G C PORV RV-3	3020				N			N		N	N	N		N									
MFWP A	3050																						
AFW MDP A	3065		N		N					N	N	N		N		N	N	N			N		
AFW SDP	3065	N	N		N				N	N	N	N		N							N		
SW PUMP A	4060											N		N									
SW PUMP B	4060											N		N									
CCW PUMP A	4080												N										
CCW PUMP B	4080												N			N							
EDG A	5095				N					N	N	N		N	N	N							
EMERGENCY BUS E1	5175										N	N					N						
DC BAT CHG A/A1	5235									N	N	N						N					
AIR COMP A	6135																						
AIR COMP PRIM	6135																						
FIRE PUMP DIESEL	6175																				N		
DEEPWELL PUMP B	6270																					N	N

PSA OF ON-LINE MAINTENANCE FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

Table 3. Matrix Showing Allowable Hours For Plant Configurations To Remain Non-Risk Significant

(DELTA CDP<1E-06)

TRAIN A MATRIX

Exceeding these allowed hours require PGM approval, review of non-quantifiable factors, contingency planning and PSA insights. X - Risk Significant Exceeds Maximum Instantaneous CDF of 1E-3 and SHOULD BE AVOIDED.		RPS CHANNEL A	RCS PZR PORV 456	RHR PUMP A	CVCS CHGP B	SI PUMP A	S/G A PORV RV-1	S/G B PORV RV-2	S/G C PORV RV-3	MFWP A	AFW MDP A	AFW SDP	SW PUMP A	SW PUMP B	CCW PUMP A	CCW PUMP B	EDG A	EMERGENCY BUS E1	DC BAT CHG A/A1	AIR COMP A	AIR COMP PRIM	FIRE PUMP DIESEL	DEEPWELL PUMP B
		1080	2005	2045	2060	2080	3020	3020	3020	3050	3065	3065	4060	4060	4080	4080	5095	5175	5235	6135	6135	6175	6270
RPS CHANNEL A	1080	875	123	134	855	326	119	119	119	380	78	71	638	638	508	519	154	793	676	771	568	647	316
RCS PZR PORV 456	2005	123	535	140	522	320	109	109	109	116	64	36	438	438	337	337	152	499	456	311	172	441	286
RHR PUMP A	2045	134	140	166	165	159	22	22	22	131	63	57	155	155	148	149	103	163	158	160	145	156	135
CVCS CHGP B	2060	855	522	165	9921	501	137	137	137	844	102	98	1997	1997	1239	551	188	5076	2469	4887	2600	2083	680
SI PUMP A	2080	326	320	159	501	508	76	76	76	322	87	82	420	420	372	378	178	480	436	477	440	422	298
S/G A PORV RV-1	3020	119	109	22	137	76	137	93	93	119	59	57	130	130	125	125	79	135	131	135	132	130	115
S/G B PORV RV-2	3020	119	109	22	137	76	93	137	93	119	59	57	130	130	125	125	79	135	131	135	132	130	115
S/G C PORV RV-3	3020	119	109	22	137	76	93	93	137	119	59	57	130	130	125	125	79	135	131	135	132	130	115
MFWP A	3050	380	116	131	844	322	119	119	119	863	16	52	635	635	532	543	156	782	673	779	690	642	378
AFW MDP A	3065	78	64	63	102	87	59	59	59	16	102	9	96	96	95	95	72	101	99	98	71	98	89
AFW SDP	3065	71	36	57	98	82	57	57	57	52	9	98	86	85	91	92	14	94	83	90	80	96	86
SW PUMP A	4060	638	438	155	1997	420	130	130	130	635	96	86	2124	93	786	867	180	1778	1270	1679	1289	938	506
SW PUMP B	4060	638	438	155	1997	420	130	130	130	635	96	85	93	2124	837	867	180	1777	1270	1679	1289	952	506
CCW PUMP A	4080	508	337	148	1239	372	125	125	125	532	95	91	786	837	869	19	155	1025	840	1092	927	841	462
CCW PUMP B	4080	519	337	149	551	378	125	125	125	543	95	92	867	867	19	853	167	1173	943	1162	961	880	470
EDG A	5095	154	152	103	188	178	79	79	79	156	72	14	180	180	155	167	189	185	178	182	178	134	127
EMERGENCY BUS E1	5175	793	499	163	5076	480	135	135	135	782	101	94	1778	1777	1025	1173	185	5861	2017	3386	2098	1752	628
DC BAT CHG A/A1	5235	676	456	158	2469	436	131	131	131	673	99	83	1270	1270	840	943	178	2017	2641	1586	1472	1284	82
AIR COMP A	6135	771	311	160	4887	477	135	135	135	779	98	90	1679	1679	1092	1162	182	3386	1586	5611	321	1729	623
AIR COMP PRIM	6135	568	172	145	2600	440	132	132	132	690	71	80	1289	1289	927	961	178	2098	1472	321	2791	1318	583
FIRE PUMP DIESEL	6175	647	441	158	2083	422	130	130	130	642	98	96	938	952	841	880	134	1752	1284	1729	1318	2204	542
DEEPWELL PUMP B	6270	316	286	135	680	298	115	115	115	378	89	86	506	506	462	470	127	628	82	623	583	542	693

PSA OF ON-LINE MAINTENANCE FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

Table 3. Matrix Showing Allowable Hours For Plant Configurations To Remain Non-Risk Significant

(DELTA CDP<1E-06)

TRAIN B MATRIX

Exceeding these allowed hours require PGM approval, review of non-quantifiable factors, contingency planning and PSA insights. X - Risk Significant Exceeds Maximum Instantaneous CDF of 1E-3 and SHOULD BE AVOIDED.		RPS CHANNEL B	RCS PZR PORV 455C	RCS BLOCK VALVES	RHR PUMP B	CVCS CHGP A	CVCS CHGP C	SI PUMP C	MFWP B	AFW MDP B	SW PUMP C	SW PUMP D	CCW PUMP C	EDG B	DSDG	DS BUS	EMERGENCY BUS E2	DC BAT CHG B/B1	AIR COMP B	AIR COMP D	FIRE PUMP MOTOR	DEEPWELL PUMP A	DEEPWELL PUMP C
		1080	2005	2005	2045	2060	2060	2080	3050	3065	4060	4060	4080	5095	5098	5114	5175	5235	6135	6135	6175	6270	6270
RPS CHANNEL B	1080	875	123	402	167	607	844	551	441	95	106	102	520	99	205	107	591	780	771	531	166	698	316
RCS PZR PORV 455C	2005	123	534	92	158	406	509	395	119	65	118	114	341	119	177	127	413	498	311	178	150	446	286
RCS BLOCK VALVES	2005	402	92	1956	198	913	1653	876	420	106	140	134	636	75	256	163	943	1539	1266	582	189	1322	520
RHR PUMP B	2045	167	158	198	221	199	219	195	169	70	90	87	192	77	124	96	197	214	210	185	107	210	169
CVCS CHGP A	2060	607	406	913	199	1556	380	812	705	116	137	92	807	91	253	172	891	1447	1476	788	187	1138	515
CVCS CHGP C	2060	844	509	1653	219	380	6801	1291	1041	122	149	142	546	115	247	49	1553	4277	4547	1232	205	2612	673
SI PUMP C	2080	551	395	876	195	812	1291	1464	612	98	137	131	733	108	235	149	812	1217	1122	707	183	1088	482
MFWP B	3050	441	119	420	169	705	1041	612	1089	24	133	127	625	105	225	141	682	946	966	626	175	798	235
AFW MDP B	3065	95	65	106	70	116	122	98	24	123	64	63	113	61	82	51	115	118	88	51	77	119	105
SW PUMP C	4060	106	118	140	90	137	149	137	133	64	150	37	136	66	97	79	139	147	148	125	67	142	78
SW PUMP D	4060	102	114	134	87	92	142	131	127	63	37	143	130	56	96	79	128	140	141	120	64	136	76
CCW PUMP C	4080	520	341	636	192	807	546	733	625	113	136	130	897	107	216	X	780	1146	1164	689	181	740	471
EDG B	5095	99	119	75	77	91	115	108	105	61	66	56	107	116	28	26	109	114	114	107	74	112	100
DSDG	5098	205	177	256	124	253	247	235	225	82	97	96	216	28	279	172	243	270	269	233	120	262	202
DS BUS	5114	107	127	163	96	172	49	149	141	51	79	79	X	26	172	172	130	153	168	148	92	165	115
EMERGENCY BUS E2	5175	591	413	943	197	891	1553	812	682	115	139	128	780	109	243	130	1661	1350	1376	754	185	1124	475
DC BAT CHG B/B1	5235	780	498	1539	214	1447	4277	1217	946	118	147	140	1146	114	270	153	1350	5207	2998	1100	201	2173	613
AIR COMP B	6135	771	311	1266	210	1476	4547	1122	966	88	148	141	1164	114	269	168	1376	2998	5611	324	201	2364	623
AIR COMP D	6135	531	178	582	185	788	1232	707	626	51	125	120	689	107	233	148	754	1100	324	1298	180	963	219
FIRE PUMP MOTOR	6175	166	150	189	107	187	205	183	175	77	67	64	181	74	120	92	185	201	201	180	207	197	161
DEEPWELL PUMP A	6270	698	446	1322	210	1138	2612	1088	798	119	142	136	740	112	262	165	1124	2173	2364	963	197	3458	14
DEEPWELL PUMP C	6270	316	286	520	169	515	673	482	235	105	78	76	471	100	202	115	475	613	623	219	161	14	693

PSA OF ON-LINE MAINTENANCE FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

Table 3. Matrix Showing Allowable Hours For Plant Configurations To Remain Non-Risk Significant

(DELTA CDP<1E-06)

TRAIN A BY TRAIN B MATRIX

Exceeding these allowed hours require PGM approval, review of non-quantifiable factors, contingency planning and PSA insights. X - Risk Significant Exceeds Maximum Instantaneous CDF of 1E-3 and SHOULD BE AVOIDED.		RPS CHANNEL B	RCS PZR PORV 455C	RCS BLOCK VALVES	RHR PUMP B	CVCS CHGP A	CVCS CHGP C	SI PUMP C	MFWP B	AFW MDP B	SW PUMP C	SW PUMP D	CCW PUMP C	EDG B	DSDG	DS BUS	EMERGENCY BUS E2	DC BAT CHG B/B1	AIR COMP B	AIR COMP D	FIRE PUMP MOTOR	DEEPWELL PUMP A	DEEPWELL PUMP C
		1080	2005	2005	2045	2060	2060	2080	3050	3065	4060	4060	4080	5095	5098	5114	5175	5235	6135	6135	6175	6270	6270
RPS CHANNEL A	1080	107	123	402	167	607	844	455	441	95	106	102	520	99	205	107	591	780	771	531	166	698	316
RCS PZR PORV 456	2005	123	259	447	160	407	509	400	119	65	118	114	341	119	177	127	414	498	311	178	150	446	286
RHR PUMP A	2045	134	141	128	X	153	165	150	135	70	79	77	149	21	105	85	152	162	160	145	93	160	135
CVCS CHGP B	2060	855	521	1790	220	764	1261	1368	1058	122	150	143	1304	110	248	83	1591	4577	4887	1255	205	2971	680
SI PUMP A	2080	326	320	268	155	405	498	X	349	99	117	112	378	23	182	128	398	475	477	373	148	454	298
S/G A PORV RV-1	3020	119	109	129	23	128	136	67	123	65	72	70	125	63	93	77	128	135	135	125	83	133	115
S/G B PORV RV-2	3020	119	109	129	23	128	136	67	123	65	72	70	125	63	93	77	128	135	135	125	83	133	115
S/G C PORV RV-3	3020	119	109	129	23	128	136	67	123	65	72	70	125	63	93	77	128	135	135	125	83	133	115
MFWP A	3050	380	116	382	163	603	833	535	88	96	129	124	544	102	214	144	183	479	779	533	168	670	378
AFW MDP A	3065	78	64	92	69	97	101	95	85	10	61	59	95	22	75	63	17	27	98	89	68	100	89
AFW SDP	3065	71	36	75	62	97	97	88	60	10	43	42	92	12	146	110	75	86	90	76	66	96	86
SW PUMP A	4060	638	437	1068	202	951	1951	909	749	117	97	70	868	67	241	100	661	1641	1679	708	124	1222	506
SW PUMP B	4060	638	437	1068	202	968	1951	909	748	117	97	71	888	63	234	99	661	1641	1679	708	124	1222	506
CCW PUMP A	4080	508	337	619	190	217	1216	712	610	113	136	130	18	96	215	172	711	1089	1092	671	180	721	462
CCW PUMP B	4080	519	337	589	192	806	1276	733	625	113	136	130	20	86	178	X	729	1137	1162	689	181	710	470
EDG A	5095	154	152	140	71	129	175	94	182	40	47	39	146	X	31	27	150	183	182	166	99	181	127
EMERGENCY BUS E1	5175	793	499	1591	215	1493	4709	1226	927	94	25	25	1065	113	270	131	16	3234	3386	1127	150	2283	628
DC BAT CHG A/A1	5235	676	455	1196	198	1139	2379	837	283	21	34	34	868	111	257	136	996	48	1586	590	163	1628	82
AIR COMP A	6135	771	311	1266	210	1476	4547	1122	968	88	148	141	1164	114	269	168	1376	2998	5611	324	201	2364	623
AIR COMP PRIM	6135	568	172	738	186	1166	2500	976	817	113	144	137	963	112	258	163	908	1569	321	155	194	1612	583
FIRE PUMP DIESEL	6175	647	440	1104	203	1345	2018	923	758	117	137	92	882	92	264	165	998	1688	1729	854	17	1450	542
DEEPWELL PUMP B	6270	316	286	520	169	515	673	482	235	105	78	76	471	100	202	115	475	613	623	219	161	14	14

98. Given the following plant conditions:

- The plant is in Mode 6
- Refueling operations are in progress
- A Containment Purge is in progress
- Annunciator APP-036-E7, RAD MONITOR TROUBLE, alarms
- The Balance of Plant Operator (BOP) reports a Fail Light on R-11

Which ONE (1) of the following describes the appropriate response to this situation?

A. Refueling Operations may continue and the Containment Purge may continue as long as R-12 remains operable.

B. Refueling Operations may continue and the Containment Purge may continue as long as R-12 remains operable and R-11 is returned to service within 1 hour.

C. Immediately close the Containment Purge supply and exhaust valves. Refueling Operations must be suspended until R-11 is returned to service.

D. Immediately close the Containment Purge supply and exhaust valves. Refueling Operations may continue.

99. Given the following plant conditions:

- At 0310 the reactor tripped due to a loss of offsite power
- EDG "A" failed to start and will not manually start
- At 0317, the "B" EDG output breaker tripped and can not be reclosed and the crew transitions from PATH-1 to the appropriate procedure for the plant conditions
- At 0325, the STA reports the following regarding Critical Safety Function Status:

Subcriticality	Green
Core Cooling	Orange (go to FRP-C.2)
Heat Sink	Red (go to FRP-H.1)
Integrity	Green
Containment	Green
Inventory	Yellow (go to FRP-I.2)

Which ONE (1) of the following best describes the actions of the CRSS regarding procedure use based on the information provided by the STA?

A. Remain in current procedure, no transition required

B. Transisiton to "Response to Degraded Core Cooling", FRP-C.2

C. Transisiton to"Response to Loss of Secondary Heat Sink", FRP-H.1

D. Transisiton to"Response to Voids in Reactor Vessel", FRP-I.2

100. Given the following plant conditions:

- An event occurred on Unit 2 at 0805
- The Superintendent of Shift Operations (SSO) assumes the duties of the Site Emergency Coordinator (SEC)
- The SSO performs the following:

0808 Enters EAL-1

0811 Determines Fuel Fission Product Barrier (FPB) - Breached

0812 Determines RCS FPB - Jeopardized

0813 Determines Containment FPB - Intact

0816 Completes EAL-1 flowpath

Which ONE (1) of the following describes the event classification, the time by which the SSO should make a declaration and the time by which the State and County should be notified?

A. Alert should be declared by 0810 and notification made by 0825

B. Site Area Emergency should be declared by 0811 and notification made by 0826

C. Alert should be declared by 0820 and notification made by 0835

D. Site Area Emergency should be declared by 0820 and notification made by 0835

Test Name: SRO.TST
Test Date: Wednesday, February 25, 1998

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	51	FP-001-06	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	52	EPTSC-04-04	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	53	ESF-SEQ-NEW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	54	NGGC-1301-NEW	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	55	OMM-015-NEW	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	56	NI-10	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	57	ESF-04	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	58	PZR-14	011	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	59	PATH-1-03	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	60	TS-2.1	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	61	AOP-005-03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	62	NI-12	005	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	63	FRP-H.1-03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	64	AOP-009-08	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	65	AOP-013-03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	66	RM-08	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	67	SG-10	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	68	AFW-09	005	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	69	PZR-14	006	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	70	RDCNT-08	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	71	AOP-020-09	005	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	72	RPS-07	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	73	EPP-005-03	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	74	CVHVAC-09	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	75	MSS-14	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	76	EPP-009-06	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	77	DC-08	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	78	GP-008-04	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	79	RPS-NEW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	80	AOP-001-04	001	MC-SR	1	A	A	A	A	A	A	A	A	A	A
1:	81	AOP-001-07	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	82	AOP-001-04	003	MC-SR	1	A	A	A	A	A	A	A	A	A	A
1:	83	EPP-008-NEW	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	84	EPP-020-08	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	85	EPP-004-03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	86	AOP-014-03	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	87	FRP-S.1-02	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	88	RM-09	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	89	TS-3.4.11	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	90	TS-3.4.13	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	91	AFW-10	005	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	92	OMM-008-03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	93	TS-1HOUR-NEW	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	94	OMM-001-07-NOTIFY	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	95	RCS-13	003	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	96	TS-3.3	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	97	OMM-048-NEW	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	98	CVHVAC-PURGE	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	99	EPP-001-03	016	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	100	OMM-031-03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A

Test Name: SRO.TST
Test Date: Wednesday, February 25, 1998

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	1	ICCM-09	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	2	AOP-003-03	005	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	3	NI-09	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	4	ESF-09	012	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	5	SFP-05	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	6	EPP-001-03	007	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	7	AOP-020-08	005	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	8	FP-001-02	002	MC-SR	1	C	C	C	C	C	C	C	C	C	C
1:	9	PZR-RPS	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	10	SW-09	003	MC-SR	1	B	B	B	B	B	B	B	B	B	B
1:	11	FP-09	001	MC-SR	1	B	B	B	B	B	B	B	B	B	B
1:	12	EPP-001-05	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	13	SG-14	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	14	EPP-001-04	006	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	15	AOP-018-03	003	MC-SR	1	D	C	D	A	B	A	C	B	D	A
1:	16	EPP-008-03	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	17	SD-10	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	18	AOP-005-03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	19	RHR-04	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	20	EDG-NEW	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	21	AOP-018-03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	22	RM-13	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	23	AOP-018-NEW	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	24	AOP-014-03	003	MC-SR	1	C	B	C	C	D	D	A	D	B	A
1:	25	AOP-010-05	007	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	26	CVCS-14	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	27	PZR-14	006	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	28	EDG	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	29	FOLDOUT-A	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	30	SI-06	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	31	CVCS-04	004	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	32	GP-003-ITS	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	33	EPP-001-06	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	34	AFW-10	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	35	ESF-04	004	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	36	AFW-10	010	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	37	CVCS-14	004	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	38	CVCS-BORON-NEW	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	39	PATH-1-04	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	40	DC-14	001	MC-SR	1	B	B	B	B	B	B	B	B	B	B
1:	41	RM-09	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	42	PZR-14	002	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	43	SG-11	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	44	AOP-019-03	007	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	45	EPP-001-03	010	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	46	CCW-09	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	47	SUPPLEMENT E	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	48	AOP-024-05	003	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	49	AOP-004-03	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	50	FRP-H.1-03	003	MC-SR	1	B	C	D	A	B	C	D	A	B	C

CP&L

Carolina Power & Light Company
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

RNP File No: 13510
Serial: RNP-RA/98-0043

MAR 0 5 1998

Mr. Luis A. Reyes
Regional Administrator, Region II
United States Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
POST EXAMINATION COMMENTS FOR INITIAL OPERATOR
LICENSE EXAMINATIONS ADMINISTERED DURING FEBRUARY 1998

Dear Mr. Reyes:

This letter provides comments on the operating portion of the initial NRC license examination administered from February 23-27, 1998, at the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2. The enclosed comments are submitted in accordance with NUREG-1021, "Operator Licensing Examiner Standards," Section 402, "Administering Written Examinations at Power Reactors." In addition, the enclosure also includes the subject test questions and an excerpt from the applicable procedures that support the comments. Post examination comments are required to be submitted by March 6, 1998.

If you have any questions concerning this matter, please contact Mr. H. K. Chernoff of my staff.

Very truly yours,

John S. Keenan

J. S. Keenan

ALG/alg
Enclosure
c: USNRC Document Control Desk (w/o Enclosure)
Mr. J. W. Shea, USNRC Project Manager, HBRSEP (w/o Enclosure)
USNRC Resident Inspector, HBRSEP (w/o Enclosure)
Mr. T. A. Peebles, USNRC Region II

United States Nuclear Regulatory Commission
Enclosure to Serial: RNP-RA/98-0043
16 Pages

ENCLOSURE

POST EXAMINATION COMMENTS FOR INITIAL OPERATOR
LICENSE EXAMINATIONS ADMINISTERED DURING FEBRUARY 1998

SRO(U) IP-018, Question 1

041 A4.06 - 2.9/3.1

REFERENCE ALLOWED

QUESTION:

Given the following plant conditions:

- Unit is in Mode 3, preparing for RCS cooldown
- Main Steam Isolation Valves (MSIVs) are closed

Assess the effects on RCS Tavg of lowering the SG PORV controller potentiometer settings on the RTGB.

ANSWER:

RCS Tavg would increase to a higher value.
(Not required for credit): Reverse acting controller ... lowering the potentiometer setting increases the setpoint causing the SG PORVs to open at a higher steamline pressure.

REFERENCE:

System Description, SD-031, section 4.2

Include as correct:

RCS Tavg would increase to a higher value if the SG PORV was open prior to the potentiometer setting being raised.
RCS Tavg would remain unchanged if the SG PORV was already closed.

RO Admin. A.4 (Fire Brigade), Question 1

2.4.25 - 2.9/3.4

REFERENCE ALLOWED

QUESTION:

Given the following plant conditions:

- 100% power, steady-state
- "A" Emergency Diesel Generator (EDG) was declared inoperable $6^1/_2$ days ago for planned maintenance on:
  - ⇒ the engine, auxiliaries and generator,
  - ⇒ ventilation supply and exhaust fans and associated dampers,
  - ⇒ fire detection and suppression system
- All work is complete on the "A" EDG except:
  - final assembly of the ventilation supply fan, scheduled to be complete in 24 hours

If the EDG Room door was propped open, would it be allowable to declare the EDG operable? Why or why not?

ANSWER:

The "A" EDG could not be declared operable. Blocking open a Diesel Room door does not provide enough ventilation flow to cool a running diesel.

REFERENCE:

FP-014, "Control of Fire Barrier Penetrations", Note prior to step 7.4.5.2

Include as correct:

The EDG can not be declared operable with the ventilation supply fan inoperable.

REFERENCE:

OWP-007, DG-1

CP&L

R
Reference
Use

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3
PART 10

OPERATIONS WORK PROCEDURE

OWP-007

DIESEL GENERATORS (DG)

REVISION 47

This procedure/activity has been screened in accordance with PLP-037 criteria and determined to be:
(check one)

CASE ONE ☐ CASE TWO ☐ CASE THREE ☐
N/A ☐

SUMMARY OF CHANGES

DATE	REVISION #	REVISION COMMENTS
11/10/97	47	This procedure has been reformatted/converted to Word. No text has changed.

TABLE OF CONTENTS

1. This revision has been verified to be the latest revision available.

Name (Print)	Initial	Signature	Date

2. System: "A" DG Work Request No: _____

3. Component: Diesel Generator "A"/Lube Oil Recirc Pump/Heater/Service Wtr Hx. Room Fans/Room Fan Breakers

4. Scope of Work: Repair Diesel Engine/Generator, repair Lube Oil Recirc Pump/Oil Heater/Service Water Hx., Repair Room Fans/Perform Inspections/Repair Breakers / Maintenance on Engine and/or Generator Control Panel / Maintenance on Solenoids.

5. Testing required on redundant equipment prior to rendering component inoperable:
None

6. Precaution: 1) Ensure normal electrical lineup is maintained. 2) Refer to Tech Spec 3.7 (ITS LCO 3.8.1 or LCO 3.8.2) for EDG applicability and operability requirements. 3) Drain any fluid system to containers to prevent fluids from entering floor drains. 4) Ensure the air start solenoids are isolated prior to removing power to prevent the Diesel from starting. 5) The position for maintenance steps shall be performed in the established order to prevent thermal expansion of the service water side of the heat exchanger. 6) This activity has been screened IAW PLP-037 criteria and determined to be a Case Three activity. No additional management involvement is required beyond that routinely provided by first line supervision.

7. Valve/Breaker/Switch lineup has been completed. _____ / _____
Signature Date

8. Clearance Issued (If applicable) Clearance No: _____

9. Testing required on redundant equipment while component is inoperable.
When the RCS temperature is greater than 200°F (MODES 1,2,3, or 4) use OP-604 Section 8.10 to perform the required actions.

10. I&C Maintenance lineup complete. N/A / _____
Signature Date

11. Clearance removed and Valve/Breaker/Switch lineup restored to normal.

Signature / Date

12. Post Maintenance Testing.

a. Pressurize any liquid system worked on and check for leaks.

Signature / Date

b. Test operate Diesel Generator "A" per OST-401-1 or OST-409-1.

Signature / Date

c. Check Lube Oil Recirc Pump/Heater for proper operation and leaks, if repaired.

Signature / Date

d. For work on the engine, initial start of engine should be at low speed per OP-604/OST-401-1 to check for abnormal noise and vibration if required.

Signature / Date

e. Test run Diesel Generator "A" room fans

Signature / Date

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE	INITIALS	VERIFIED BY	RESTORED POSITION	INITIALS	VERIFIED BY
MAINTENANCE ON ENGINE ALONE						
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
Generator Output BKR 52/17B	OPEN, FUSES PULLED & RACKED OUT			RACKED IN, FUSES IN & OPERABLE		
RTGB Indication	LOST			RESTORED		
MAINTENANCE ON GENERATOR / ENGINE / GENERATOR CONTROL PANEL / ENGINE CONTROL PANEL / SOLENOIDS						
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DA-21A Diesel Starting Solenoid Outlet Isol.	CLOSED			LOCKED OPEN		
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DA-25A Diesel Starting Solenoid Outlet Isol.	CLOSED			LOCKED OPEN		
Generator Output BKR 52/17B	OPEN, FUSES PULLED & RACKED OUT			RACKED IN, FUSES IN & OPERABLE		
RTGB Indication	LOST			RESTORED		
DG "A" Exciter Supply (DC Dist. Panel "A" Ckt #8)	OPEN			CLOSED		
Emergency DC Excitation Supply Knife Switch	NORMAL			NORMAL		
DG "A" Control Power (DC Dist Panel "A" CKT #24)	BREAKER OPEN			BREAKER CLOSED		

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE			RESTORED POSITION		
MAINTENANCE ON COOLING WATER SYSTEM COMPONENTS						
		INITIALS	VERIFIED BY		INITIALS	VERIFIED BY
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED			LOCKED OPEN		
DW-264 Demineralized Water Make-up to Expansion Tank	CLOSED			OPEN		
Jacket Coolant Heater "A" BKR (480V PWR Box "A" CB-2)	OPEN			CLOSED		
Standby Coolant Circ. Pump "A" BKR (480V PWR Box "A" CB-1)	OPEN			CLOSED		
DG-33A After Coolant Pump "A" Suction Drain	OPEN*			CLOSED*		
DG-34A Engine Driven Jacket Water Pump "A" Suction Drain	OPEN*			CLOSED*		
DG-35A Hx Shell Side Drain	OPEN*			CLOSED*		
DG-36A Hx Shell Side Vent	OPEN*			CLOSED*		

*N/A these steps if draining is not accomplished by this method.

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE		RESTORED POSITION	
MAINTENANCE ON LUBE OIL SYSTEM COMPONENTS				
	INITIALS	VERIFIED BY	INITIALS	VERIFIED BY
DG-18A lube Oil Strainer Drain Valve	OPEN_____	_____	CLOSED _____	_____
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED_____	_____	LOCKED OPEN _____	_____
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED_____	_____	LOCKED OPEN _____	_____
Lube Oil Recirc Pump "A" BKR (480V PWR Box "A" CB-4)	OPEN_____	_____	CLOSED _____	_____
DG-21A Lube Oil Prelube Pump Suction	CLOSED_____	_____	OPEN _____	_____
DG-23A Lube Oil Recirc Pump Suction	CLOSED_____	_____	OPEN _____	_____
Pre-Lube Pump "A" BKR (480V PWR Box "A" CB-3)	OPEN_____	_____	CLOSED _____	_____
Generator Output BKR 52/17B	OPEN, FUSES PULLED RACKED OUT_____	_____	RACKED IN, FUSES INSTALLED _____	_____
RTGB Indication	LOST_____		RESTORED _____	

VALVE, BREAKER, SWITCH LINEUP

COMPONENT DESCRIPTION	POSITION FOR MAINTENANCE		RESTORED POSITION	
MAINTENANCE ON SERVICE WATER HX				
	INITIALS	VERIFIED BY	INITIALS	VERIFIED BY
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED		LOCKED OPEN	
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED		LOCKED OPEN	
SW-85 TCV Inlet Isol.	CLOSED		OPEN	
SW-87 TCV Bypass	CLOSED		CLOSED	
SW-88 Coolers Return Isol.	CLOSED		OPEN	
DG-9A Coolers Vent	OPEN		CLOSED	
DG-12A Coolers Drain	OPEN		CLOSED	

MAINTENANCE ON HVS-6 FAN/BREAKER OR HVE-18 FAN/BREAKER				
	INITIALS	VERIFIED BY	INITIALS	VERIFIED BY
DA-18A Diesel Starting Solenoid Inlet Isol.	CLOSED		LOCKED OPEN	
DA-22A Diesel Starting Solenoid Inlet Isol.	CLOSED		LOCKED OPEN	
HVS-6 "A" Diesel Room Supply Fan Breaker (MCC-5)	OPEN		CLOSED	
HVE-18 "A" Diesel Room Exhaust Fan Breaker (MCC-5)	OPEN		CLOSED	

RO JPM CR-019, Question 1

004 A4.04 3.2/3.6
006 A1.02 3.0/3.6
006 A1.13 3.5/3.7

REFERENCE ALLOWED

QUESTION:
Given the following plant conditions:

- Mode 5, plant heatup / startup activities in progress
- "A" SI Accumulator level has just been raised from 50% to 70%
  - ♦ boron concentration was 1810 ppm prior to being filled
- RWST boron concentration is 2277 ppm

Determine the post-fill boron concentration in the "A" Accumulator and any compensatory actions, if required.

ANSWER:

- [.5] 1943 ppm

Formula: $C_1V_1 + C_2V_2 = C_3V_3$

$$C_3 = \frac{C_1V_1 + C_2V_2}{V_3}$$

$$= \frac{(1810\ ppm)(50\%) + (2277\ ppm)(20\%)}{(70\%)}$$

- [.5] ITS 3.5.1 not applicable in Mode 5. Entry into Required Action not required.

REFERENCE:
GFES
ITS 3.5.1

Delete this question due to it being technically inaccurate. The accumulator level transmitters are narrow range indication only and do not account for the entire volume of the accumulator.

RO JPM CR-019, Question 2

006 K1.03 4.2/4.3

REFERENCE ALLOWED

QUESTION:
Given the plant conditions:

- Mode 1, 100% power
- Accumulator levels / pressure
  - "A" 68% 600 psig
  - "B" 70% 630 psig
  - "C" 70% 645 psig

Annunciator APP-002-B4 "SI ACCUM A HI/LO PRESS" illuminated

QUESTION A:
Determine which accumulator parameter(s) are outside the normal operating band.

ANSWER A:
"A" Accumulator pressure is low (normal band = 614 to 646 psig)

REFERENCE ALLOWED

QUESTION B:
Can this evolution be performed and describe the basis for your response.

ANSWER B:
No, not allowed. Simultaneously opening the accumulator vent valves would connect the two accumulator gas spaces. If a large break LOCA were to occur on either of the loops ("A" or "C") both accumulators would depressurize invalidating the LOCA analysis.
(Not required for credit: Accumulator design capacity is based on one accumulator spilling to the containment floor through the break, the other two accumulators fill the core to the mid-plane.)

REFERENCE:
FSAR section 6.3.2.2.6
OP 202, step 4.20

Split these questions into Question 1 and Question 2 (due to deleting the accumulator boron concentration calculation).

Clarification on Question B (2): **"You have been directed to equalize "A" and "C" Accumulators.** Can this evolution be performed and describe the basis for your response."

RO JPM CR-023, Question 2

062 A4.07 3.7/4.2

REFERENCE ALLOWED

QUESTION:

Explain the basis for the interlock that prohibits prolonged operation with 4KV breakers

- **52/12**, START-UP TO 4KV BUS 2 AND **52/7**, UNIT AUX TO 4KV BUS 1
  AND
- **52/20**, UNIT AUX TO 4KV BUS 4 AND **52/19**, 4KV BUS 3-4 TIE BKR

closed at the same time.

ANSWER:

Prevents prolonged parallel operation of the Startup and Unit Auxiliary Transformers. Prolonged parallel operation is not desirable due to circulating currents caused by transformers not having load-sharing capability (speed droop).

REFERENCE:

LOGIC: CP-300-5379-4642

OP-603, "Electrical Distribution", step 4.2

Include as correct:

Prolonged parallel operation is not desirable due to **transformer damage from overheating / overloading**.

Prolonged parallel operation is not desirable due to **a single fault causing loss or damage to both transformers.**

REFERENCE:

KVAC Lesson Plan

a. Actuated by span bus differential, will open:

(1)East bus tie

(2)West bus tie

(3)Motor operated disconnect

(4)4KV bus 2 and 3 supply breakers 52/12 and 52/17

E. **4KV BUSES**

1. THINK button — **OBJ. #8**

a. Discussed above in 230KV controls and interlocks

b. THINK button as a 4KV breaker interlock

(1)Must be pressed simultaneously with breaker switch to open any 4KV supply/tie breaker operated from RTGB (same breakers are interlocked with synch selector interlock)

2. Other breaker interlock — **Refer 4KV fast transfer Logic Diagram** CP-300-5379-4642 **OBJ. #9,10**

a. Breakers 52/17 and 52/12 are interlocked such that they cannot be closed unless voltage is present on the SUT

b. Breakers 52/7 and 52/20 will not close unless the north or south generator breaker is closed

c. An UV condition on 4KV buses 1 and 4 will initiate automatic starting of the turbine driven auxiliary feed pump — Requires both 271 & 272 UV relays

d. Breaker 52/12 will trip automatically after 52/7 switch is released during manual closure (and vice versa)

(1)Interlock prevents prolonged parallel operation of transformers. Due to impedance differences, circulating currents can develop causing overload condition and possible loss of transformer

e. Breaker 52/19 will trip automatically after 52/20 switch

NRC RESOLUTION OF POST-EXAMINATION COMMENTS

EXAM: SRO (U)
JPM: IP-018
QUESTION : #1

Recommendation accepted. The additional information provided will be considered in the grading of this question.

EXAM: RO
ADMIN: A.4
QUESTION: #1

Recommendation accepted. The additional information provided will be considered in the grading of this question.

EXAM: RO and SRO(I)
JPM: CR-019
QUESTION: #1

Recommendation partially accepted, however, the question will not be deleted. It is acknowledged that the prescripted answer was technically incorrect, in that, the narrow range indication could not be used to calculate the concentration change due to the volume added. The applicants responses will be evaluated on their understanding of the concepts involved in concentration calculations and their knowledge of the design of the accumulators.

EXAM: RO and SRO(I)
JPM: CR-019
QUESTION: #2

Recommendation not accepted. Based on the decision for JPM CR-019, Question #1, it is not necessary to split the question to count for two questions.

EXAM: RO and SRO(I)
JPM: CR-023
QUESTION: #2

Recommendation accepted. The additional information provided will be considered in the grading of this question.