

# **INITIAL SUBMITTAL**

**SURRY RETAKE EXAM  
50-280, 281/2001-301  
APRIL 2, 2001 (WRITTEN) &  
APRIL 16-17, 2001 (ADMIN)**

**INITIAL SUBMITTAL  
RO/~~SRO~~ WRITTEN EXAMINATION**

1.

The following conditions exist:

- Unit 1 is at 100%
- Charging pump, 1-CH-P-1A, is running.
- Charging Service Water Pump, 1-SW-P-10A, is running.
- Charging Service Water Pump, 1-SW-P-10B, is tagged out for motor replacement (motor currently removed).
- All other Station components are operable.

Which ONE (1) of the following actions is required if 1-SW-P-10A trips on motor fault?

- Immediately start 1-CH-P-1B for continued operation and secure 1-CH-P-1A.
- Establish gravity feed and bleed for the 1-CH-P-1A oil cooler.
- Establish Charging Service water cross tie from the opposite unit.
- Place 1-SW-S-10 in service to establish Charging Service Water flow from the Station Service Water System.

2.

Four Operators worked the following schedule at the Reactor Operator position over the past six days: HOURS WORKED (Shift turnover time not included. Do **NOT** assume any hours worked before or after this period.)

<u>OPERATOR</u>	<u>DAY 1</u>	<u>DAY 2</u>	<u>DAY 3</u>	<u>DAY 4</u>	<u>DAY 5</u>	<u>DAY 6</u>
1	10	14	off	12	12	12
2	14	12	14	10	off	11
3	off	off	off	13	11	14
4	11	13	14	off	11	12

Which ONE (1) of the operators would be permitted to work a 12-hour shift on Day 7 **WITHOUT** requiring permission to exceed normal overtime limits?

- 1
- 2
- 3
- 4

3.

Given the following conditions:

- The unit was operating at 100% power when a pipe break occurred inside containment.
- Containment pressure is rising.
- RCS temperature is lowering.

Which ONE (1) of the following differentiates between a main feed line break inside containment and a main steam line break inside the containment of the same size?

- a. RCS heat removal would be greater for the steam line break
- b. Containment pressure would be greater for the feed line break
- c. Containment radiation levels would be greater for the steam line break
- d. RCS depressurization would be greater for the feed line break

4.

Given the following conditions:

- HP placed a radioactive waste container (primarily containing Cobalt 60) 5 feet from the Decon Building Area Radiation detector, 1-RM-RI-151.
- Prior to placement of the container, 1-RM-RI-151 was reading 2 mR/hr.
- After placement of the container 1-RM-RI-151 read 10 mR/hr.

If the container is moved 10 feet away from the 1-RM-RI-151 detector, 1-RI-RM-151 will indicate which ONE (1) of the following?

- a. 4.0 mR/hr
- b. 4.5 mR/hr
- c. 6.0 mR/hr
- d. 7.0 mR/hr

5.

Given the following conditions:

- At 0110, a Reactor Trip and Safety Injection occurred following an accident.
- At 0112, an Alert was declared due to RCS leakage.
- At 0116, a Site Area Emergency was declared.
- At 0120, a General Emergency was declared.

Which ONE (1) of the following identifies the LATEST time that the INITIAL notification to State/County officials and the NRC must be completed?

	STATE / COUNTY	NRC
a.	0125	0210
b.	0127	0212
c.	0131	0216
d.	0135	0220

6.

Given the following plant conditions:

- An emergency boration is in progress through 1-CH-MOV-1350, Emergency Borate, per FR-S.1, "Response to Nuclear Power Generation / ATWS."
- 1-CH-FI-1110, Emerg. Borate Flow indicates 33 gpm.
- 1-CH-FI-1122A, CHG Line Flow is in manual and indicates 75 gpm.
- VCT level is 30%.
- VCT Makeup is aligned for automatic operation.
- Normal letdown has been isolated.
- The team has just completed steps 3 and 4 of FR-S.1 (AFW verification and Emergency boration).

Which ONE (1) of the following describes VCT response (assuming no further operator actions)?

- a. Will remain essentially unaffected.
- b. Will decrease to the auto makeup setpoint and stabilize.
- c. Will decrease to the low-level setpoint and cause the charging pump suction to switch to the RWST.
- d. Will decrease to the auto makeup setpoint and cycle between the makeup start and stop setpoints.

7.

Given the following conditions:

- The unit is operating at 100% power.
- C-F-7, PRZR RELIEF TK HI PRESS, and C-G-7, PRZR Relief TK Hi LVL have alarmed.
- PRT level and pressure are slowly increasing, but there is **NO** appreciable increase in PRT temperature.
- **NO** other annunciators are in alarm.

Leakage past which ONE (1) of the following has caused the present PRT condition?

- a. 1-RC-PCV-1455C, Pressurizer PORV.
- b. 1-RC-SV-1551A, Pressurizer Safety valve.
- c. 1-CH-RV-1209, Low Pressure L/D Line Relief leakby.
- d. 1-CH-RV-1382, RCP #1 Seal Water Return Line Relief leakby.

8.

Which ONE (1) of the following conditions would result in a reactor trip?

- a. 1-MS-PT-1447, First Stage Turbine Pressure, fails low with power level at 22%.
- b. NI-43, PR Channel N43, fails low with power level at 49%.
- c. 1-MS-PT-1446, First Stage Turbine Pressure, fails high with power level at  $1 \times 10^{-8}$  amps.
- d. NI-44, PR Channel N44, fails high with power level at  $1 \times 10^{-8}$  amps.

9.

Which ONE (1) of the following describes why RCS subcooling must be greater than 30°F [85°F] prior to starting an RCP in FR-P.1, Response to Imminent Pressurized Thermal Shock Condition?

- a. RCP restart may result in reduced SI flow to the core leading to an inadequate core cooling situation.
- b. Inadequate subcooling corresponds to inadequate #1 RCP seal D/P using RCS Psat/Tsat relationships.
- c. RCP restart during a SBLOCA may result in deeper core uncover leading to an inadequate core cooling situation.
- d. RCP restart with inadequate subcooling may result in rapid RCS depressurization, complicating the PTS concern.

10.

Given the following plant conditions:

- The plant has experienced a reactor trip.
- The Unit SRO directs the RO to manually initiate Safety Injection.
- The RO inadvertently depresses ONE (1) Consequence Limiting Safeguards (CLS) pushbutton instead of the Safety Injection pushbuttons.

Which ONE (1) of the following identifies functions that will occur, if any?

- a. No actions occur. Simultaneous pushing of BOTH pushbuttons is required.
- b. Phase I Containment Isolation only.
- c. Phase I and Phase II Containment isolation only.
- d. Phase I, Phase II, and Phase III Containment isolation.

11.

Given the following conditions:

- The unit is operating at 77% power.
- Condenser backpressure is 25.5 in - Hg and degrading slowly.
- A power reduction is in progress in an attempt to stabilize backpressure.
- NO cause has yet been identified.

Which ONE (1) of the following actions should be taken in accordance with AP-14.00, "Loss of Main Condenser Vacuum"?

- a. Trip the reactor and go to E-0.
- b. Trip the turbine and verify the plant stabilizes on the steam dumps at the point of adding heat.
- c. Trip the turbine and verify the plant stabilizes on the steam dumps at approximately the current power level.
- d. Continue the power reduction.

12.

Given the following conditions:

- The plant is shutdown following a reactor trip.
- RCPs are all secured.
- The “B” Train ICCM fails
- “A” ICCM has been providing erratic indications.
- Primary Plant parameters indicate the following:

<u>INSTRUMENT</u>	<u>PARAMETER</u>	<u>VALUE</u>
1-RC-PI-1455	PZR Press Protection	1485 psig
1-RC-PI-1456	PZR Press Protection	1495 psig
1-RC-PI-1457	PZR Press Protection	1515 psig
1-RC-PI-1402	RCS WR Press	1485 psig
1-RC-PI-1403	RCS WR Press	1485 psig
1-RC-TI-1453	PZR Temp (Surge Line)	524°F
1-RC-TR-1454	PZR Temp (Vapor)	630°F
1-RC-TR-1413	RCS Hot Leg WR Temp	538°F
1-RC-TR-1423	RCS Hot Leg WR Temp	538°F
1-RC-TR-1433	RCS Hot Leg WR Temp	534°F
	Highest Five (5) CETCs	548°F
		544°F
		542°F
		542°F
		541°F

Which ONE (1) of the following identifies the valid subcooling indication for “A” ICCM?

- a. 46°F.
- b. 51°F.
- c. 53°F.
- d. 58°F.

13.

Given the following conditions:

- A 25 year old male started working for the Operations Department at Surry on March 3rd of this year.
- He previously worked this year at North Anna as part of the Maintenance Department.
- His exposure for this year at the North Anna plant was 1200 mRem TEDE.
- He has received **NO** Dominion management exposure extensions and **NO** emergencies exist.

Which **ONE (1)** of the following is the **TOTAL ADDITIONAL** effective dose equivalent that the individual can receive before being denied RCA access (unless specifically authorized by the Supervisor Exposure Control and Instrumentation)?

- a. 600 mRem
- b. 800 mRem
- c. 2600 mRem
- d. 3800 mRem

14.

Given the following conditions:

- Unit 1 is in a refueling outage.
- Robert Wells (Electrical Supervisor) has come to shift seeking a temporary release for 1-FW-P-1A, "A" Main Feed Pump. This temporary release is to verify interlocks with 1-FW-MOV-150A, "A" MFP Discharge valve.
- Luther Farinholt (Mechanical Supervisor) is the only other individual besides Robert Wells on the Craft Supervisor Tracking Sheet.

Which **ONE (1)** of the following individuals has the responsibility of notifying Luther Farinholt of the temporary release?

- a. Unit 1 SRO.
- b. Robert Wells.
- c. Operator assigned to perform the temporary release.
- d. Shift Clerk.

15.

Given the following conditions:

- Fuel is in the vessel; refueling has not taken place.
- RCS temperature is 120°F.
- It is 30 days after the shutdown.
- Pressurizer level is at 22%.
- RHR cooling is lost.

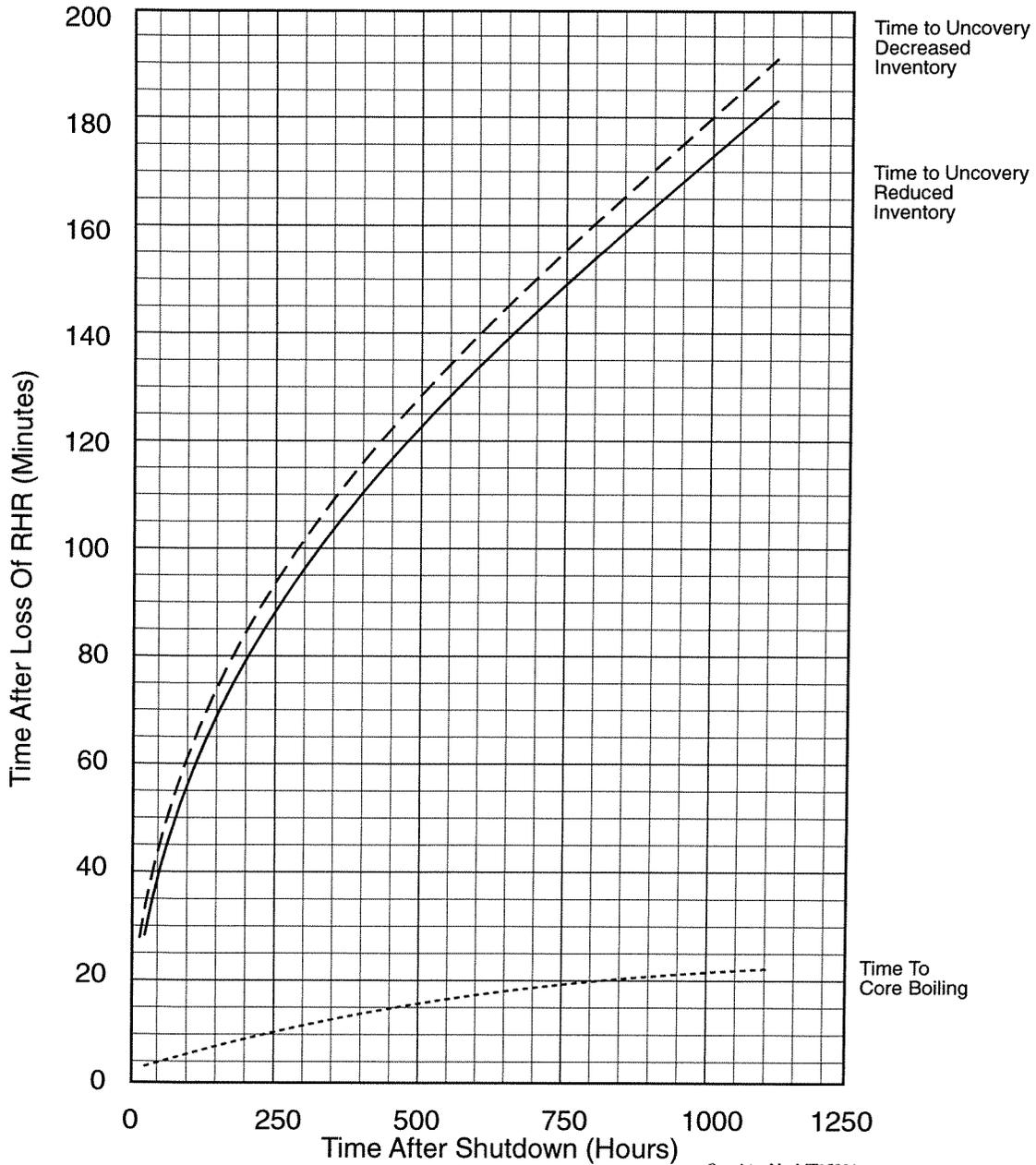
Given the supplied references, which ONE (1) of the following identifies how much time remains before boiling begins occurring in the RCS?

- a. 5 minutes
- b. 18 minutes
- c. 5 hours
- d. 18 hours

**ATTACHMENT 7**

(Page 2 of 2)

**CORE HEATUP TIMES FOR SURRY**



Graphics No: MT1526A

**CORE HEATUP TIMES**

16.

Given the following plant conditions:

- Unit is operating at 100% power.
- P-250 Computer failed.

Which ONE (1) of the following is **NOT** a log that is required to be handwritten as a result of this failure?

- a. Average Power History Log.
- b. RCP Bearing Temperature Log.
- c. Charging Pump Bearing Temperature Log.
- d. Average Delta Flux History Log.

17.

Given the following plant conditions:

- Unit 1 is at CSD - 140°F and atmospheric pressure.
- All conditions for starting an RCP IAW 1-OP-RC-001, "Starting and Running Any RCP," have been satisfied except for raising RCS pressure.

Which ONE (1) of the following describes the minimum RCS pressure required to start an RCP IAW 1-OP-RC-001?

- a. Any RCS pressure which supports a minimum #1 seal return flow of greater than 3 gpm.
- b. 200 psig
- c. 210 psig
- d. 300 psig

18.

Given the following conditions:

- A Reactor Trip and SI have occurred from an unisolable main steam line break on SG "A".
- E-0, "Reactor Trip or Safety Injection," has been completed and the team has completed E-2, "Faulted Steam Generator Isolation."
- SG "A" has been isolated per E-2, "Faulted Steam Generator Isolation," and is dry.
- RCS temperature has been stabilized by dumping steam via the S/G PORV from the intact SGs following the SG "A" dryout.
- The team has transitioned to ES-1.1, "SI Termination."
- SI flowpaths have been secured, normal charging aligned, and letdown placed in service.

Which ONE (1) of the following would be the **FIRST** indication to the operators that a 250 gpm tube leak has subsequently developed in SG "A"?

- a. Main Steamline Radiation Monitor for "A" S/G.
- b. RCS and "A" S/G pressures equalize.
- c. Pressurizer level decreasing.
- d. SG "A" level increasing.

19.

While performing 1-OPT-RX-003, "Reactor Power Calorimetric Using Feed Flow and P-250 Computer Points (Manual)," which ONE (1) of the following will result in **ACTUAL** power being **HIGHER THAN INDICATED** power?

- a. SG Blowdown is secured prior to starting the data collection.
- b. MDAFW Pump "A" is operating with flow being delivered to a SG.
- c. Indicated feedwater temperature used is lower than actual.
- d. Indicated feedwater flow used is higher than actual.

20.

Given the following conditions:

- Refueling Operations are scheduled to commence.
- RCS Boron Concentration is currently 2175 ppm.

Which ONE (1) of the following describes the Tech Spec required RCS boron concentration for refueling operations?

- a. Boron concentration is adequate.
- b. Boron concentration must be increased by a minimum of 75 ppm.
- c. Boron concentration must be increased by a minimum of 125 ppm.
- d. Boron concentration must be increased by a minimum of 175 ppm.

21.

Given the following conditions:

- A reactor shutdown is in progress.
- Annunciator G-D-3, NIS Intermediate Range Channel 1 Loss of Compensating Voltage” is lit.
- N-35 indicates stable at  $6.0 \times 10^{-10}$  amps
- N-36 indicates stable at  $1.0 \times 10^{-11}$  amps
- Gammametrics Source range, 1-NI-NFI-190A1, indicates stable at 80 counts.
- Gammametrics Source range, 1-NI-NFI-1270A1, indicates stable at 90 counts.

Which ONE (1) of the following describes the actions required by FR-S.2, Response to Loss of Core Shutdown, to obtain Source Range N-31 and N-32 indication?

- a. Push **ONLY** the “Train A Source Range Trip- reset, 1/N 39A” pushbutton.
- b. Push **ONLY** the “Train A Intermediate Rng Trip- block, 1/N 38A” pushbutton.
- c. Push **BOTH** the “Train A Intermediate Rng Trip- block, 1/N 38A” AND the “Train B Intermediate Rng Trip- block, 1/N 38B” pushbuttons.
- d. Push **BOTH** the “Train A Source Range Trip- reset, 1/N 39A” AND the “Train B Source Range Trip- reset, 1/N 39B” pushbuttons.

22.

Given the following conditions:

- The unit is operating at 100% power.
- NO scheduled releases are in progress.
- A small leak develops on an inservice letdown radiation monitor (1-CH-RI-118).
- All ventilation systems are in a normal configuration.

Which ONE of the following would alert the operators of the accidental liquid release in progress?

- a. Decon Building radiation monitor, 1-RM-RI-151.
- b. Vent Vent 1 (Turbine Building Vent Stack) Gas radiation monitor, 1-VG-R1-104.
- c. RC letdown HI radiation monitor, 1-CH-RI-118.
- d. Process vent gas radiation monitor, 1-GW-RI-102.

23.

Given the following conditions:

- The Control Room has filled with dense smoke from a Main Control Room fire on Unit 1.
- The reactor has been tripped manually by operators.
- The Control Room has been evacuated due to the dense smoke.

Which ONE (1) of the following identifies the procedure(s) that will be used to stabilize Unit 1 conditions after Main Control Room evacuation?

- a. 1-E-0, "Reactor Trip Safety Injection."
- b. 0-AP-48.00, "Fire Protection – Operations Response."
- c. 0-AP-20.00, "Main Control Room Inaccessibility."
- d. 0-FCA-1.00, "Limiting MCR Fire."

24.

Given the following conditions:

- The unit is operating at 100% power.
- 1-OPT-RX-005 "Control Rod Assembly Partial Movement," is being performed.
- Annunciator G-A-6, ROD CONT SYSTEM URGENT FAILURE, alarms just as Control Bank "C" rods are being withdrawn.

Which ONE (1) of the following describes the required operator action?

- a.
  - This is an expected alarm.
  - Continue withdrawing Control Bank "C" rods.
- b.
  - Immediately trip the reactor.
  - Initiate 1-E-0, "Reactor Trip or Safety Injection."
- c.
  - Place the ROD BANK SELECTOR switch in Manual.
  - Do NOT move rods until cause of alarm determined.
- d.
  - Place the ROD BANK SELECTOR switch in Manual.
  - Restore Tave and Tref by adjusting rods to pre-test value.

25.

During an accident condition on Unit One, the Balance of plant operator questions the validity of a pressure indication causing a Main Control Room annunciator. He notes there is a black diamond next to the mark number on the bakelite label.

Which ONE (1) of the following identifies the significance of this "Black Diamond"?

- a. A maintenance rule risk significant component.
- b. Environmentally qualified.
- c. A Technical Specification Table 3.7 item.
- d. A Regulatory Guideline 1.97 indication.

26.

Given the following conditions:

- The Fuel Handling group reports a dropped spent fuel assembly in the Spent Fuel Pool.
- A valid High Radiation alarm has been acknowledged for 1-RM-153, Fuel Pit Bridge.
- The operating team has entered AP-22.00, "Fuel Handling Abnormal Conditions."

Which ONE (1) of the following actions is required to maintain the Main Control Room environment acceptable?

- a. Place the Fuel Building on filtered exhaust.
- b. Secure all Main Control Room supply and exhaust air paths.
- c. Isolate the Main Control Room supply and exhaust air paths and dump one bottled air bank.
- d. Dump both Main Control bottled air banks while maintaining MCR exhaust paths.

27.

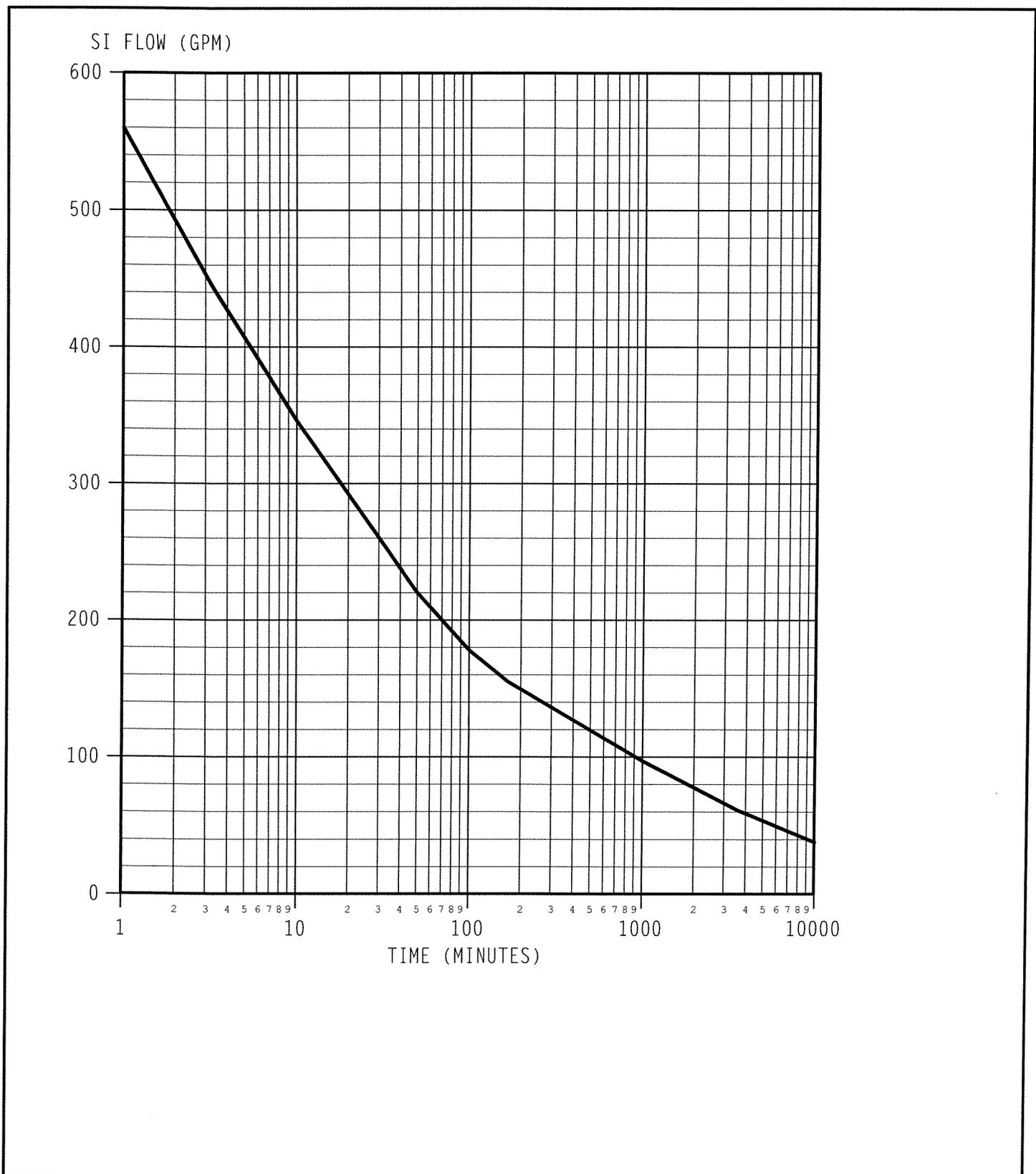
Given the following conditions:

- A large break (DBA) LOCA has occurred.
- 2-ECA-1.1, "Loss of Emergency Coolant Recirculation," is being implemented.
- One HHSI Pump is running.
- No LHSI pumps are available.
- Time after trip and SI is 1 hour.
- SI CANNOT be terminated due to insufficient subcooling.

Given the supplied references, which ONE (1) of the following states the MINIMUM SI flow for these conditions?

- a. 560 gpm.
- b. 385 gpm.
- c. 210 gpm.
- d. 200 gpm.

NUMBER 2-ECA-1.1	ATTACHMENT TITLE MINIMUM SI FLOWRATE FOR DECAY HEAT REMOVAL VERSUS TIME FROM REACTOR TRIP	REVISION 16
ATTACHMENT 2		PAGE 1 of 1



28.

Given the following conditions:

- The unit is operating at 24% power during a plant startup.
- Rods are being withdrawn to raise RCS temperature.
- When the IN-HOLD-OUT lever is released, rods continue to step outward.

Which ONE (1) of the following actions should be taken?

- a. Place the ROD BANK SELECTOR switch in Automatic and verify rod motion stops.
- b. Place the ROD BANK SELECTOR switch into an individual control bank position and verify rod motion stops.
- c. Manually trip the reactor and go to E-0, "Reactor Trip or Safety Injection."
- d. Place the IN-HOLD-OUT lever in the "IN" position and verify rods step in or stop.

29.

A Unit 1 Containment Purge is in progress.

Which ONE (1) of the following will automatically terminate the purge on a high radiation signal?

- a. 1-RM-RI-162, Manipulator Crane.
- b. 1-GW-RI-101, Process Vent Particulate.
- c. 1-VG-RI-104, Vent Vent 1 GAS.
- d. 1-VG-RI-109, Vent Vent Particulate.

30.

Given the following conditions:

- Reactor power is 35%.
- All control systems are in automatic.
- Pressurizer level transmitter 2-RC-LT-2459 is selected to the upper control channel.
- A small leak develops across the differential pressure bellows for 2-RC-LT-2459, resulting in pressure equalizing across the bellows.

Assuming **NO** operator actions, which **ONE (1)** of the following describes the initial instrumentation and plant response to this leak?

	<b>2-RC-LI-459 PZR LVL</b>	<b>2-RC-LI-460 PZR LVL</b>
a.	Increases	Increases
b.	Increases	Decreases
c.	Decreases	Increases
d.	Decreases	Decreases

31.

Given the following conditions:

- All systems are in automatic.
- At 100% power, 1-FCV-CN-107 fails open.
- Alarms H-G-5/6/7, STM GEN A/B/C level errors annunciate.
- All SG narrow range levels are decreasing.

Which **ONE (1)** of the following actions is required per AP-21.00, "Loss of Main Feedwater Flow?"

- Take manual control of main feed reg. valves and increase flow.
- Trip the reactor and perform E-0, "Reactor Trip or Safety Injection."
- Start the 3<sup>rd</sup> condensate pump and reduce turbine load using the limiter.
- Perform a rapid load reduction per AP-23.00, "Rapid Load Reduction."

32.

The following information is available:

<b>INDICATOR</b>	<b>PRE-EVENT VALUE</b>	<b>POST-EVENT VALUE</b>
CTMT Temp 1-LM-TI-100-1	90°F	105°F
CTMT Temp 1-LM-TI-100-2	92°F	107°F
CTMT Press 1-LM-PI-101A	10 psia	19.8 psia
CTMT Press 1-LM-PI-101B	10.2 psia	19.9 psia

Given the attached references, which ONE (1) of the following approximates the required “B” electric hydrogen recombiner power setting?

- a. 51 KW
- b. 41 KW
- c. 34 KW
- d. 26 KW

NUMBER 1-FR-I.3	ATTACHMENT TITLE ELECTRIC HYDROGEN RECOMBINER OPERATION	REVISION 15
ATTACHMENT 5		PAGE 1 of 2

\*\*\*\*\*

CAUTION: Emergency Diesel Generator loading must not exceed 2675 KW before the Hydrogen Recombiner is energized.

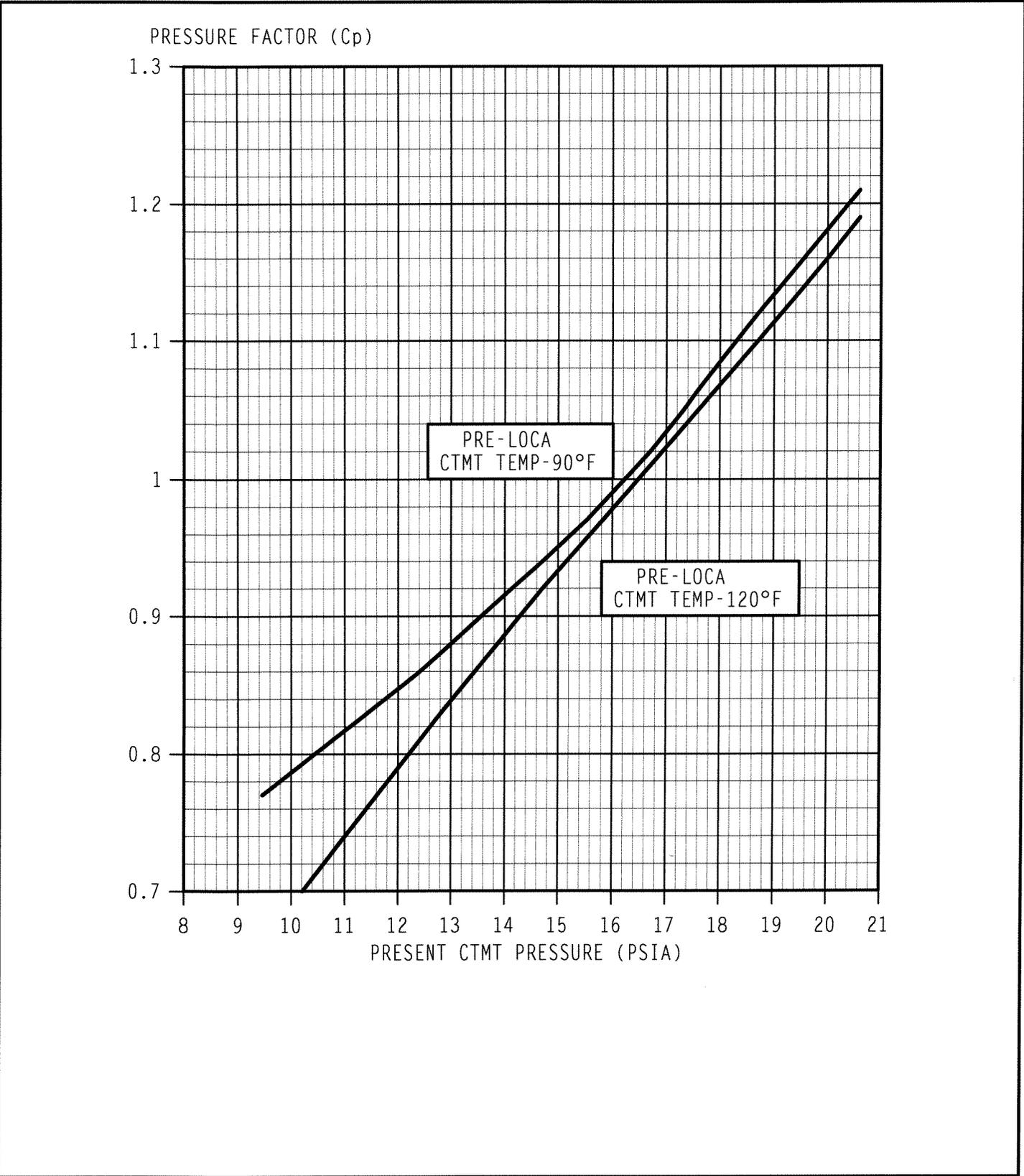
\*\*\*\*\*

PLACING RECOMBINERS IN SERVICE

NOTE: Heater temperature as determined by any thermocouple should not exceed 1400 °F.

- \_\_ 1. Turn the POWER OUT switch to ON.
- \_\_ 2. Record present CTMT pressure. \_\_\_\_\_ PSIA
- \_\_ 3. Record pre-LOCA CTMT temperature. \_\_\_\_\_ °F
- \_\_ 4. Determine the Pressure Factor (C<sub>p</sub>) IAW Attachment 6.
- \_\_ 5. Calculate the Recombiner power setting using the following:  
       \_\_\_\_\_(C<sub>p</sub>) x 34.8 KW = \_\_\_\_\_ (1A required power setting)  
       \_\_\_\_\_(C<sub>p</sub>) x 43.4 KW = \_\_\_\_\_ (1B required power setting)
- \_\_ 6. Adjust the POWER ADJUST pot clockwise until 5 KW is obtained on the POWER OUT meter. Hold 5 KW for ten minutes.
- \_\_ 7. Adjust the POWER ADJUST pot until 10 KW is obtained on the POWER OUT meter. Hold 10 KW for ten minutes.
- \_\_ 8. Adjust the POWER ADJUST pot until 20 KW is obtained on the POWER OUT meter. Hold 20 KW for five minutes.
- \_\_ 9. Adjust the POWER ADJUST pot to obtain the required power setting calculated in Step 5. Allow the Recombiner to stabilize for 2 hours.
- \_\_10. Monitor the temperature of the three thermocouples. Adjust the POWER ADJUST pot to maintain an average thermocouple reading within a range of 1150 °F to 1200 °F. (An adjustment of 4 KW will result in a temperature change of approximately 75 °F.)

NUMBER 1-FR-I.3	ATTACHMENT TITLE  PRESSURE FACTOR CALCULATION	REVISION 15
ATTACHMENT 6		PAGE 1 of 1



33.

Which ONE (1) of the following shift manning configurations is **NOT** allowed in accordance with OPAP-0001, "Operations Department Responsibilities and Authorities," minimum shift requirements, with both units at 100% power?

	<u>SS</u>	<u>SRO</u>	<u>RO</u>	<u>AO</u>	<u>STA</u>
a.	1	1	3	9	1
b.	1	3	4	4	2
c.	1	1	4	7	1
d.	1	2	6	3	2

34.

Given the following conditions:

- Unit 1 is operating at 100% power.
- Annunciator B-E-6, "IA LO HDR PRESS/IA COMPR 1 TRBL," has just illuminated.
- All station-related air controls and components are available with controllers/controls in auto.
- Unit 1 Instrument air pressure currently reads 79 psig and slowly decreasing.
- Assume all automatic actions have occurred and all components are functioning as designed

Which ONE (1) of the following has **NOT** automatically performed an action to assist in maintaining air pressure?

- a. 1-SA-SOV-175, Service air isolation, automatically closes.
- b. Unit 2 Service Air Compressor auto-started.
- c. 1-IA-D-1, "Unit 1 Instrument Air Dryer," bypassed.
- d. Unit 1 Instrument Air Compressor auto-started.

35.

Given the following conditions:

- The unit was operating at 100% with bank D rods at 218 steps when a failure of UPS 1A1 inverter occurred. The static switch does not swap.
- NO reactor trip occurred.
- Rods CANNOT be withdrawn.

Which ONE (1) of the following is preventing rod motion?

- a. Power range high flux rod stop
- b. Intermediate range high flux rod stop
- c. Overtemperature  $\Delta T$  rod stop
- d. Overpower  $\Delta T$  rod stop

36.

Given the following plant conditions:

- A SI occurred on Unit 1 due to a SBLOCA.
- The team has completed 1-E-0, "Reactor Trip or Safety Injection."
- The team transitioned to 1-E-1, Loss of Reactor or Secondary Coolant."
- Containment pressure is 13.2 psia and slowly increasing.

Which ONE (1) of the following would prevent terminating SI when the SI termination criteria step is performed?

- a. RCS subcooling is 40°F and slowly decreasing.
- b. S/G level is 25% and slowly increasing.
- c. RCS pressure is 1890 psig and slowly decreasing.
- d. Pressurizer level is 30% and slowly decreasing.

37.

Given the following conditions:

- Unit 2 is in mid-loop operation to repair a S/G primary manway leak.
- The RCS is vented by two Pressurizer Safety Valves being removed.
- RCS level is 12.5 feet in the Standpipe and rising very slowly.
- RHR pump "A" is in service at 3500 gpm.
- The operator notices that RHR flow and pump discharge pressure are oscillating.

Which ONE (1) of the following actions would tend to stabilize RHR flow and pressure?

- a. Start the RHR pump "B" at 3500 gpm.
- b. Lower charging flow to stabilize RCS level.
- c. Lower "A" RHR pump flow.
- d. Open the RV head vents.

38.

Given the following conditions:

- Unit 1 is operating at 100% power.
- #3 EDG is tagged out to repair a leaking oil fitting.
- A tornado touches down in the switchyard.
- The transient resulting from the destruction causes a trip of the Main Generator.
- "A" and "C" Reserve Station Transformers are destroyed by debris generated by the tornado.
- #1 EDG is unable to start due to a faulty air lineup.
- After the initial transient, it is noted that BOTH of the Reactor Trip breaker indications are RED.

Which ONE (1) of the following describes the required operator action(s)?

- a. Enter FR-S.1, "Response to Nuclear Power Generation / ATWS," due to the ATWS.
- b. Enter E-0, "Reactor Trip or Safety Injection," due to the turbine trip and then FR-S.1 due to the ATWS.
- c. Enter ECA-0.0, "Loss of All AC Power," due to the electrical conditions.
- d. Enter FR-S.1 due to the ATWS, then ECA-0.0 due to the electrical conditions.

39.

Given the following plant conditions:

- Unit 1 is operating at 100% power.
- A pipe break in the Component Cooling (CC) System in the Auxiliary Building results in a loss of CC requiring implementation of AP-15.00, "Loss of Component Cooling."

Which ONE (1) of the following will require the Reactor Operator to manually trip Unit 1?

- a. Efforts to restore CC flow have failed.
- b. 0-VSP-D7, CC Surge Tank Low Level annunciator alarms and surge tank level is decreasing.
- c. Auxiliary Building radiation monitors are alarming due to the high activity in the CC System.
- d. Efforts to establish makeup to the CC System were not successful within five (5) minutes.

40.

Given the following conditions:

- RCS pressure is 1805 psig and slowly decreasing.
- All Main Steam Trip Valves are open.
- Tavg is 537°F and decreasing.
- Steam Generator pressures and Steam Flows are:

<u>SG</u>	<u>PRESSURE</u>	<u>STEAM FLOW</u>
"A"	615 psig and decreasing	$1.7 \times 10^6$ lbm/hr
"B"	745 psig and stable	$0.05 \times 10^6$ lbm/hr
"C"	740 psig and stable	$0.05 \times 10^6$ lbm/hr

Which ONE (1) of the following Safety Injection signals would be actuated?

- a. Header to Line ΔP.
- b. Low Pressurizer Pressure.
- c. High Steam Line Flow with Low Tave.
- d. High Steam Line Flow with Low Steam Line Pressure.

41.

Hi Hi CLS will actuate when (1) out of (2) containment pressure channels increase to 23 psia. Hi Hi CLS can be reset when (3) channels decrease to (4) psia.

Which ONE (1) of the following sets of parameters completes the coincidence and setpoint for Hi Hi CLS?

- |    | <u>(1)</u> | <u>(2)</u> | <u>(3)</u> | <u>(4)</u> |
|----|------------|------------|------------|------------|
| a. | 2          | 3          | 3          | 17.7       |
| b. | 3          | 4          | 2          | 14.2       |
| c. | 2          | 4          | 3          | 14.7       |
| d. | 3          | 3          | 2          | 14.7       |

42.

Given the following conditions:

- The unit is operating at 100% power.
- Normal letdown is in service.
- Pressurizer level control is in automatic.
- Leakage past the hydrogen pressure regulator to the VCT causes pressure in the VCT to increase.

Which ONE (1) of the following describes the effect on RCP seal flow?

	No. 1 SEAL LEAKOFF FLOW	No. 2 SEAL LEAKOFF FLOW
a.	Increases	Increases
b.	Decreases	Decreases
c.	Decreases	Increases
d.	Increases	Decreases

43.

Given the following conditions:

- A reactor trip occurred from 20% power as a result of a low-low level in “A” SG.
- Coincident with the reactor trip, “H” bus de-energized and was subsequently energized by the #1 EDG.
- Twenty (20) seconds following the trip, SG levels have decreased to a minimum value of:

<u>SG</u>	<u>LEVEL</u>
“A”	12%
“B”	28%
“C”	26%

Which ONE (1) of the following describes the expected condition of the Auxiliary Feedwater pumps 20 seconds following the trip?

	<b>MDAFW PUMP “A”</b>	<b>MDAFW PUMP “B”</b>	<b>SDAFW PUMP</b>
a.	Running	Running	Off
b.	Off	Running	Running
c.	Off	Running	Off
d.	Off	Off	Running

44.

Given the following conditions:

- The plant is operating at 50% power.
- All control systems are operating in automatic.
- The First Stage Pressure Channel Selector switch is aligned to the PT-447 position.
- First Stage Pressure Transmitter PT-446 fails low.

Which ONE (1) of the following plant responses is expected?

- a. Feedwater Regulating Valves throttle closed.
- b. Control Rods step inward.
- c. Automatic rod control is blocked.
- d. Steam Dumps have a demand signal.

45.

Given the following conditions:

- Spent fuel water temperature is 102°F.
- Fuel Building room temperature is 89°F.

Which ONE (1) of the following describes the Main Control Room spent fuel pool temperature indication if pool level drops 3 feet?

- a. Temperature increases due to less water mass to absorb the spent fuel decay heat.
- b. Temperature increases off-scale high due to RTD failure mode.
- c. Temperature decreases off-scale low due to RTD failure mode.
- d. Temperature decreases to approximately room temperature due to uncovering the RTD.

46.

With the reactor critical at  $7 \times 10^{-6}$  amps, the vital bus breaker supplying N-35, Intermediate Range NI, trips.

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

- a. Reactor trip due to 1/2 Intermediate range bistables greater than 35%.
- b. Rods step in due to power core power mismatch.
- c. Auto rod withdrawal is blocked but manual withdrawal is not affected.
- d. No effect.

47.

Given the following conditions:

- 1-SI-P-1A, "A" LHSI pump is tagged out for seal replacement.
- A LOCA has occurred inside Containment.
- Following the Safety injection, "J" bus power was lost and **NOT** restored (fault on the bus).
- The team has progressed through E-0, E-1, and is currently in ECA-1.1, "Loss of Emergency Coolant Recirculation," due to no LHSI pumps running.
- Containment pressure is currently 32 psia and slowly decreasing.

Using the supplied reference and the conditions above, which ONE (1) of the following identifies the CS and RS spray configurations the operating team is capable of establishing to meet the CS requirements?

- a. 2 CS pumps and 2 RS pumps.
- b. 2 CS pumps and 1 RS pump.
- c. 1 CS pump and 2 RS pumps.
- d. 1 CS pump and 3 RS pumps.

NUMBER  1-ECA-1.1	PROCEDURE TITLE  LOSS OF EMERGENCY COOLANT RECIRCULATION	REVISION 15  PAGE 9 of 25
-------------------------	--	---------------------------------------

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\*10. \_\_CHECK RWST LEVEL - GREATER THAN 3%

GO TO Step 30.

NOTE: Any pumps taking suction from the RWST must be stopped before level decreases to 3%.

11. \_\_DETERMINE CS REQUIREMENTS:

a) Determine number of CS pumps required:

CONTAINMENT PRESSURE	RS PUMPS RUNNING	CS PUMPS REQUIRED
GREATER THAN 60 PSIA	—	2
BETWEEN 14 PSIA AND 60 PSIA	FEWER THAN 2	2
	2 OR MORE	1
LESS THAN 14 PSIA	—	0

b) CS pumps running - EQUAL TO NUMBER REQUIRED

b) Manually operate CS pumps.

12. \_\_CHECK IF SI IN SERVICE:

GO TO Step 21.

- HHSI to cold legs - FLOW INDICATED

OR

- LHSI pumps - ANY RUNNING

48.

Given the following conditions:

- A recovery from a small break LOCA is in progress.
- NO RCPs are running.
- 1-ES-1.2, "Post-LOCA Cooldown and Depressurization," is being implemented.
- Depressurization of the RCS has commenced.
- Pressurizer level has just risen rapidly from off-scale low to 50%.

Which ONE (1) of the following identifies why the pressurizer level has rapidly increased?

- Increased SI flow.
- Voiding of the reactor vessel head.
- Increased pressurizer spray flow.
- Voiding in the pressurizer level reference leg, causing erroneous indication.

49.

Given the following conditions:

- The unit is operating at 100% power.
- Rod Control is in Manual.
- A safety valve fails open on SG "B".

Which ONE (1) of the following describes the effect on indicated power and RCS Tavg?

	<b>INDICATED NIS POWER</b>	<b>RCS T-AVG</b>
a.	Increases	Remains Relatively Constant
b.	Increases	Decreases
c.	Remains Relatively Constant	Remains Relatively Constant
d.	Remains Relatively Constant	Decreases

50.

Given the following conditions:

- The unit is operating at 85% power.
- Control Rod Bank "D" Demand is at 195 steps.
- IRPI indication for Bank "D" Group 1 Control Rods are as follows:

<u>ROD</u>	<u>POSITION</u>
H-2	181 steps
B-8	181 steps
H-14	205 steps
P-8	205 steps

Which ONE (1) of the following ensures Tech Spec rod alignment requirements are met?

- a. Are met under these conditions.
- b. If Control Rods H-2 and B-8 is verified aligned to at least 183 steps.
- c. If power is reduced below 60%.
- d. If Control Rod H-14 and P-8 are verified aligned to at most 197 steps.

51.

Given the following conditions:

- A reactor trip and safety injection have occurred.
- Due to multiple failures, an entry has been made to 1-ECA-2.1, "Uncontrolled Depressurization of All Steam Generators."
- Containment pressure is 9 psia.
- The RCS cooldown rate is 130°F/hour.
- AFW flow is presently greater than 400 gpm to each S/G.
- SG wide range levels are:

<u>SG</u>	<u>LEVEL</u>
"A"	1%
"B"	3%
"C"	14%

Which ONE (1) of the following actions should be taken?

- a. Secure all AFW to "A" and "B" SGs, while feeding "C" SG at a rate of 60 gpm.
- b. Secure all AFW flow to all SGs until "C" SG is below 7%, then feed ONLY "C" SG at a rate of 60 gpm.
- c. Feed "A" and "B" SGs at a rate of 60 gpm while feeding "C" SG only as needed to maintain the RCS cooldown rate below 100°F/hour.
- d. Feed all SGs at a rate of 60 gpm.

52.

Given the following conditions:

- The unit is operating at 100% power.
- Testing is being performed on Reactor Trip Breaker "B" and it is currently open.
- A loss of the "A" 125 VDC Distribution Panel occurs.
- Reactor Trip Breaker "A" fails to open.

Which ONE (1) of the following describes the expected response of the plant due to this sequence of events, assuming NO operator action?

- a. NO reactor trip occurs.
- b. Reactor Trip Bypass Breaker "B" opens on an Undervoltage trip ONLY, resulting in a reactor trip.
- c. Reactor Trip Bypass Breaker "B" opens on a Shunt trip ONLY, resulting in a reactor trip.
- d. Reactor Trip Bypass Breaker "B" opens on BOTH an Undervoltage trip and a Shunt trip, resulting in a reactor trip.

53.

Given the following conditions:

- The unit is in Hot Standby.
- A change in boron concentration from 500 ppm to 470 ppm is required.

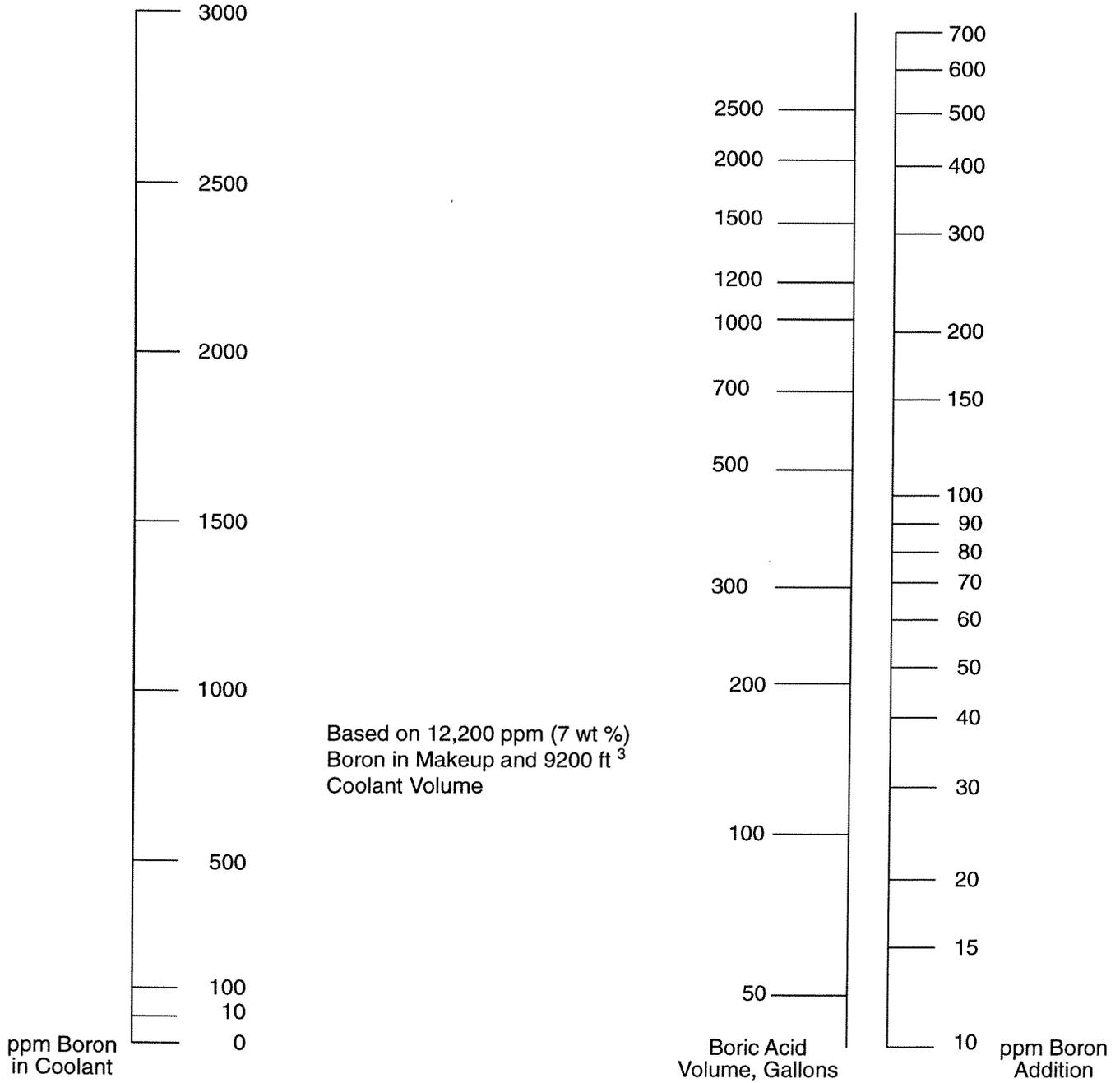
Given the supplied references, which ONE (1) of the following identifies approximately how many gallons of primary water must be added to make this change?

- a. 70 gallons
- b. 90 gallons
- c. 3,000 gallons
- d. 4,500 gallons

**ATTACHMENT 10**

(Page 1 of 1)

**BORON ADDITION - COOLANT HOT**



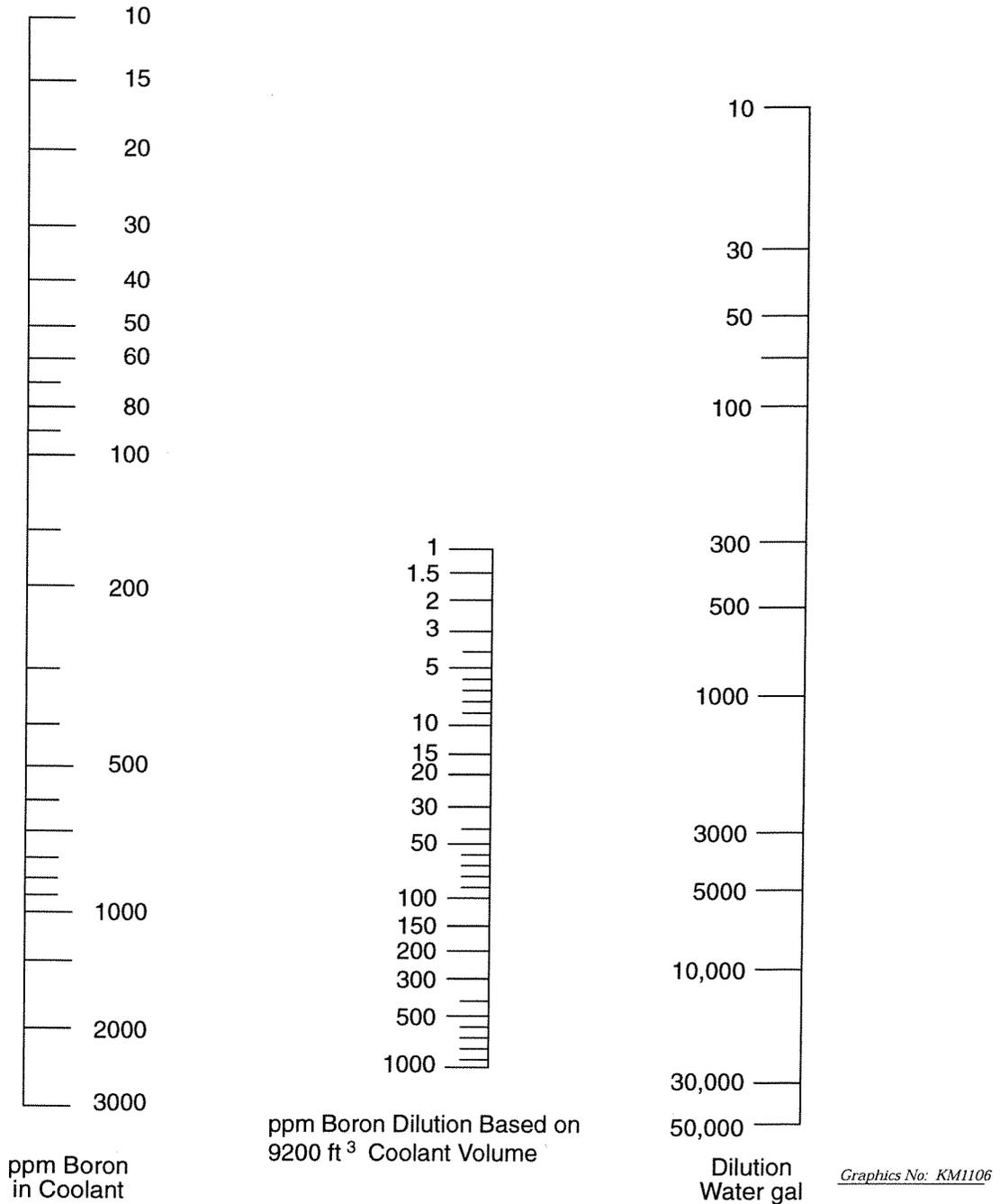
**BORON ADDITION RATE - COOLANT HOT (~ 580°F)  
FIGURE S-3.1-3**

Graphics No: KM1104B

**ATTACHMENT 14**

(Page 1 of 1)

**DILUTION NOMOGRAPH - COOLANT HOT**

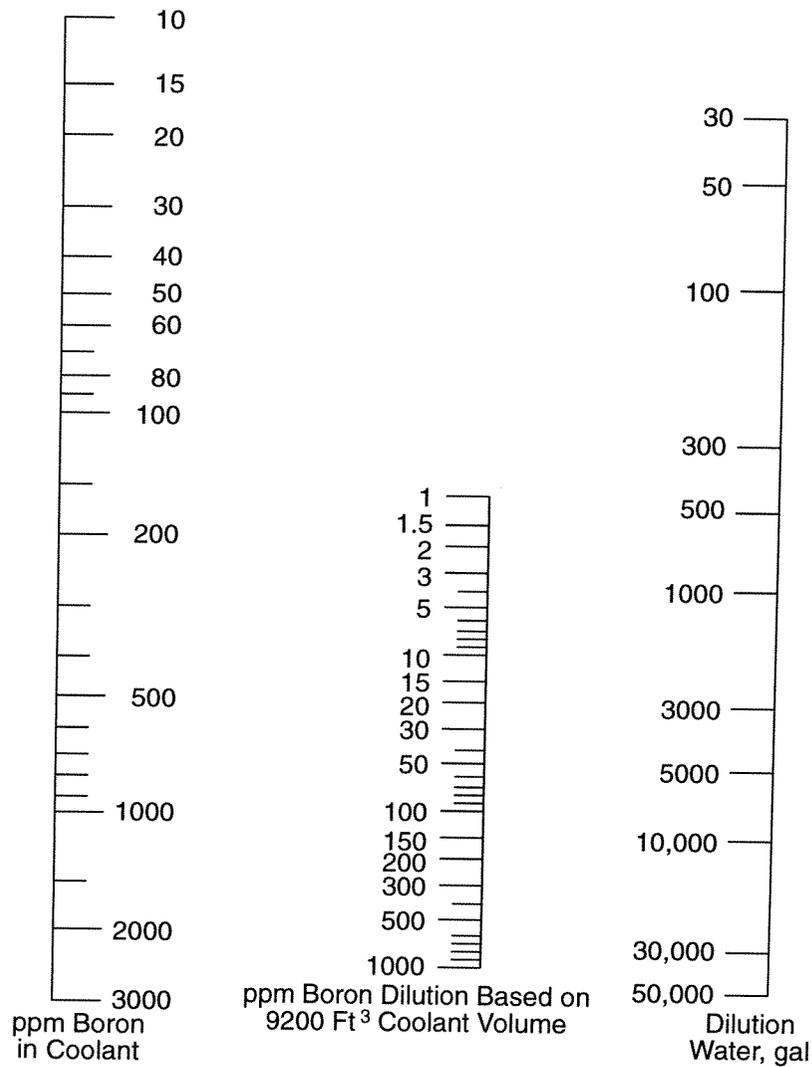


**DILUTION VOLUME NOMOGRAPH - COOLANT HOT (~ 580°F)  
FIGURE S-3.1-7**

**ATTACHMENT 15**

(Page 1 of 1)

**DILUTION NOMOGRAPH - COOLANT COLD**



*Graphics No: CB1422*

**DILUTION VOLUME NOMOGRAPH - COOLANT COLD (~ 100°F)  
FIGURE S-3.1-8**

54.

Given the following conditions:

- Unit 2 is being ramped to 100% following a refueling outage.
- The following Plant Parameters are noted:

<u>PARAMETER</u>	<u>VALUE</u>
Loop "A" Tavg	574°F
Loop "B" Tavg	573°F
Loop "C" Tavg	573°F
NI-41	100.0%
NI-42	99.0%
NI-43	99.0%
NI-44	100.0%
Loop "A" ΔT	102%
Loop "B" ΔT	102%
Loop "C" ΔT	102%
Loop "C" Steam Flow	$3.9 \times 10^6$ lbm/hr
Loop "B" Steam Flow	$3.9 \times 10^6$ lbm/hr
Loop "C" Steam Flow	$3.95 \times 10^6$ lbm/hr
Loop "A" Feed Flow	$3.9 \times 10^6$ lbm/hr
Loop "B" Feed Flow	$3.9 \times 10^6$ lbm/hr
Loop "C" Feed Flow	$3.85 \times 10^6$ lbm/hr
1 <sup>st</sup> Stage Press (446)	101%
1 <sup>st</sup> Stage Press (447)	101%
Generator Output	865 MWe

Which ONE (1) of the following indicates actual reactor power and the expected operations response?

- a. 99.5%. The power ramp may continue until the plant is at 100%.
- b. 99.5%. Power should be held constant to perform a calorimetric.
- c. Greater than 100%. Power should be held constant to perform a calorimetric.
- d. Greater than 100%. Power should be immediately lowered.

55.

Which ONE (1) of the following identifies the minimum level of approval for a safety-related temporary modification?

- a. Shift Supervisor (SS)
- b. Operations Manager on Call (OMOC)
- c. Station Nuclear Safety Operating Committee (SNSOC)
- d. Management Safety Review Committee (MSRC)

56.

Given the following conditions:

- The plant is operating at 43% power.
- An electrical transient causes a momentary underfrequency condition on "A" 4160V SS Bus.
- Moments later, an undervoltage condition is also sensed on "A" 4160V SS Bus.
- The RCP powered from "A" 4160V SS Bus trips.
- The other two RCPs remain running.

A reactor trip occurs due to the above transient.

Which ONE (1) of the following identifies the signal, which **DIRECTLY** generated the reactor trip?

- a. Bus underfrequency
- b. Bus undervoltage
- c. Low flow
- d. Pump breaker trip

57.

The following plant conditions exist:

- Unit 1 was at 100% power when a Hi-Hi CLS signal was received.
- All three containment air recirc fans were operating at the time of the Hi-Hi CLS signal.

Which ONE (1) of the following describes the response of the Containment Air Recirc fans to the CLS signal?

- a. All Containment Air Recirc Fans trip off.
- b. No Containment Air Recirc Fans trip off.
- c. "A" and "B" Containment Air Recirc Fans trip off.
- d. "C" Containment Air Recirc Fan trips off.

58.

The following conditions exist:

- Unit 1 is operating at 100% power.
- "B" Charging pump is running.
- "A" Charging pump is in Auto.
- "C" Charging pump is in Auto with its normal supply breaker racked in.

Which ONE (1) of the following would occur if the Inside Service Building Operator racked in the "C" Charging pump alternate supply breaker?

- a. "C" Charging pump would auto-start after "B" Charging pump trips.
- b. "B" Charging pump would trip and no other charging pump would auto-start.
- c. "A" and "C" Charging pumps will auto-start after "B" Charging pump trips.
- d. "A" Charging pump only would auto-start after "B" Charging pump trips.

59.

Given the following conditions:

- The unit is experiencing a loss of all feedwater event and FR-H.1, "Response to Loss of Secondary Heat Sink," has been entered.
- NO AFW flow is available.

Which ONE (1) of the following describes when the operator is required to trip the RCPs and immediately initiate feed and bleed?

- a. Five highest core exit TC temperatures are 652°F, 650°F, 649°F, 648°F, and 645°F and are all rising.
- b. RCS hot leg temperatures are 652°F, 646°F, and 648°F and are all rising.
- c. Pressurizer levels are indicating 83%, 87%, and 84% and are all rising.
- d. SG wide range levels are 5%, 6%, and 12% and are all stable.

60.

Given the following conditions:

- A Unit trip and safety injection have occurred due to a Steam Generator Tube Rupture on "A" SG.
- 1-ES-3.1, "Post-SGTR Cooldown using Backfill," is being implemented.
- RCS pressure is 940 psig.
- It has been determined that the accumulators should be isolated.
- The breakers for the accumulator discharge valves (1-SI-MOV-1865A, B, C) have been closed.
- The "A" accumulator discharge valve (1-SI-MOV-1865A) loses light indication after it is given a closed signal.
- "B" and "C" accumulator valves stroke closed as expected.

Which ONE (1) of the following actions should be taken regarding "A" accumulator?

- a. Slow the rate at which the RCS is being depressurized to allow a controlled injection of the accumulator.
- b. Drain the accumulator to the Primary Drains Transfer Tank.
- c. Vent the accumulator to the Process Vent System.
- d. Maintain RCS pressure above 800 psig until a Containment entry can be made to locally close the discharge valve.

61.

The Unit Reactor Operator needs a short-term relief to get his lunch in the Annex and take a restroom break.

Which ONE (1) of the following is NOT required to be performed as part of turnover to the relieving Reactor Operator?

- a. Shift Relief Checklist must be completed.
- b. Verifying that no uncontrolled unit transient is in progress.
- c. Discuss evolutions in progress that could affect unit status.
- d. Inform Unit Senior Reactor Operator that turnover has occurred.

62.

Given the following conditions:

- The unit is operating at 100% power.
- RCS Tavg is 573°F and stable.
- PZR level is 53.7% and stable
- VCT level is 31% and stable.
- Letdown flow is 45 gpm (FI-150).
- RCP seal injection flows are:

<u>RCP</u>	<u>SEAL INJ</u>
"A"	8.3 gpm
"B"	7.9 gpm
"C"	7.8 gpm

- Seal return flows are:

"A"	3.4
"B"	3.3
"C"	3.3

Which ONE (1) of the following would be the expected flow indication on 1-CH-FI-122A, Charging Header Flow, assuming NO RCS leakage?

- a. 21 gpm
- b. 31 gpm
- c. 36 gpm
- d. 54 gpm

63.

The following conditions exist:

- A valve lineup is required on the Gas stripper.
- Operations and Health Physics have predicted the following:
- The lineup will take 4.5 Man-Hours.
- The dose rates within the area are 30 mr/hr.
- If shielding were placed, the dose rates would be 10 mr/hr.
- The time to place the shielding is 1.25 hours and takes 2 persons (assume the dose rate for these individuals is 30 mr/hr during the entire evolution).

Which ONE (1) of the following identifies the minimum dose that can be achieved for this evolution?

- a. 45 mr
- b. 83 mr
- c. 120 mr
- d. 135 mr

64.

Given the following conditions:

- The Unit was operating at 100% power.
- G-A-6, ROD CONT SYS URGENT FAILURE is lit.
- G-B-5, COMPU PRINTOUT ROD CONT SYS is lit.
- G-H-1, NIS DROPPED ROD FLUX DECREASE > 5% PER 2 SEC is lit.
- G-H-2 RPI ROD BTM < 20 STEPS is lit.

Which ONE (1) of the following procedures is initially implemented to respond to the event?

- a. AP-1.00, "Rod Control System Malfunction."
- b. AP-1.01, "Control Rod Misalignment."
- c. AP-1.02, "Individual Rod Position Indicators (IRPI)."
- d. AP-4.00, "Nuclear Instrumentation Malfunction."

65.

Given the following conditions:

- A line break caused the Fire Header pressure to drop.
- Fire Header pressure eventually stabilized at 83 psig.

Which ONE (1) of the following expected fire system responses would have resulted in this condition?

- a. The Electric Fire Pump automatically started, then the Diesel Fire Pump automatically started.
- b. The Electric Fire Pump automatically started and the Diesel Fire Pump remained in standby.
- c. The Diesel Fire Pump automatically started, then the Electric Fire Pump automatically started.
- d. The Diesel Fire Pump automatically started and the Electric Fire Pump remained in standby.

66.

Given the following conditions with the #1 EDG paralleled to the "F" transfer bus for a load test:

- Voltage – 4200 V
- Load – 1560 Kw
- Speed – 900 RPM
- VARS - +270 KVAR
- Frequency – 59.8 Hz

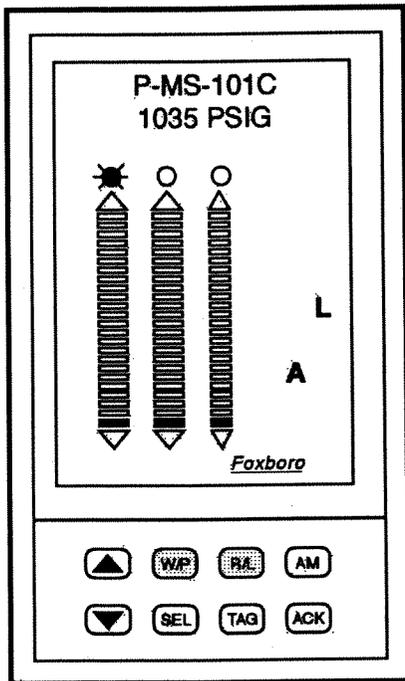
Which ONE (1) of the following describes the indications of taking the "Emerg Gen No 1 Volt ADJ" to the lower position?

- a. Voltage decreases
- b. VARS decrease
- c. Speed decreases
- d. Frequency increases

67.

Given the following plant conditions:

- Unit 1 is operating at 100% power.
- The "A" S/G PORV controller is in the condition pictured below.



- The steam line pressure input to the "A" S/G PORV controller fails high.

Which ONE (1) of the following describes the "A" S/G PORV response to this failure?

- No response. The PORV controller is in LOCAL CONTROL from the instrument racks.
- The "A" S/G PORV opens fully.
- No response. The PORV is in the SETPOINT ADJUST mode of control.
- The PORV is incapable of automatic operation due to the controller sensing an input failure.

68.

Given the following conditions:

- A small break LOCA has occurred.
- Entry has been made into FR-C.1, "Response to Inadequate Core Cooling."
- CETs are all indicating between 740°F and 760°F and rising slowly.
- RCS pressure has stabilized at 1605 psig.
- PZR level is off-scale low.
- RVLIS Full Range is indicating 39% and lowering slowly.
- HHSI is NOT available.
- SG pressures are all between 360 psig and 400 psig.

Which ONE (1) of the following actions should be taken?

- a. Dump steam to cooldown and depressurize the RCS to provide LHSI flow.
- b. Open the RCS Vent System valves to depressurize the RCS to provide LHSI flow.
- c. Start an RCP immediately to provide forced cooling flow.
- d. Open the PZR PORVs to depressurize the RCS to provide LHSI flow.

69.

Given the following plant conditions:

- Unit 1 is operating at 100% power.
- Unit 2 is operating at 60% power with "A" MFP out of service for repairs.
- Low Level Transformer 1G is lost due to a lightning strike, causing a loss of four (4) Circ Water Pumps.

Which ONE (1) of the following describes the correct operator response for this event IAW AP-12.01, "Loss of Intake Canal Level?"

- a. Reduce turbine load and throttle Circ Water to the condenser waterboxes to conserve canal level. When condenser vacuum reaches 19" Hg, manually trip both Units.
- b. Manually trip both Units when Annunciator B-E-6, INTAKE CANAL HI-LO LEVEL, alarms for low canal level at 26 feet.
- c. Initiate 1-E-0, Reactor or Safety Injection, when canal level decreases to 23.5 feet.
- d. Manually trip both Units when canal level decreases below 17 feet, 2 inches.

70.

Given the following conditions:

- The unit is operating at 2% power.
- The following RCP indications are observed:

<u>INDICATION</u>	<u>RCP "A"</u>	<u>RCP "B"</u>	<u>RCP "C"</u>
Motor Bearing Temperatures	210°F and ↑ slowly	180°F and stable	195°F and ↑ slowly
#1 Seal Leakoff Temperatures	150°F and stable	150°F and stable	165°F and ↑ slowly
#1 Seal Leakoff Flow	5.8 gpm and stable	4.2 gpm and stable	3.8 gpm and stable
Seal Injection	7.4 gpm	8 gpm	8.2 gpm
Frame Vibration	3.6 mils and ↑ at 0.1 mil per hr	2.8 mils and stable	4 mils and ↑ at 0.05 mil per hr
Shaft Vibration	12 mils and stable	7 mils and stable	9.5 mils and ↑ at 0.6 mils per hour

Which ONE (1) of the following describes the actions required for this condition?

- a. Stop "A" RCP and enter Technical Specification 3.1, Reactor Coolant System.
- b. Trip the reactor, initiate E-0, "Reactor Trip or Safety Injection," and stop "A" RCP.
- c. Stop "C" RCP and enter Technical Specification 3.1, Reactor Coolant System.
- d. Trip the reactor, initiate E-0, "Reactor Trip or Safety Injection," and stop "C" RCP.

71.

A fire in the Main Control Room has forced evacuation. The fire has initiated a transient, which has left NO Unit 1 CC pumps running.

Which ONE (1) of the following identifies how a Unit 1 CC pump can be restarted?

- a. Depress the "START" pushbutton inside the breaker cubicle.
- b. Transfer control to the Aux Shutdown Panel (ASDP) and start the pump at the ASDP.
- c. At the Breaker panel, select "Local," and start the pump at the breaker control panel.
- d. Locally start the pump from the Unit 1 Appendix "R" panel.

72.

Which ONE (1) of the following actions occurs when a high radiation alarm is received on RI-CC-105 or 106, Component Cooling Water Radiation Monitor?

- a. Isolates the makeup header to the Component Cooling (CC) System.
- b. Shuts the CC Surge Tank Vent Valve.
- c. Isolates the RCP thermal barrier CC return header.
- d. Shuts the CC Temperature Control Valve to the NRHX.

73.

Given the following plant conditions:

- Unit 1 is in Refueling Shutdown.
- Fuel movement is in progress.
- Due to a malfunction in the manipulator crane control circuitry, the underload protection circuit stopped the hoist downward travel before the fuel assembly was fully set down on the lower core plate pins.

Which ONE (1) of the following individuals can authorize the interlock bypass for the underload condition to allow fully lowering the fuel assembly into the core?

- a. Unit 1 SRO.
- b. Shift Supervisor.
- c. Refueling SRO.
- d. Operations Manager on Call (OMOC).

74.

Given the following conditions:

- The unit is operating at 50% power.
- PZR level transmitter 1-RC-LT-460 (channel II) failed low and was removed from service.
- The PZR high level Reactor Trip and low level Annunciator bistables associated with 1-RC-LT-460 were placed in the TRIPPED condition.
- PZR level channel selector switch 1-RC-LM-459 was selected to Position 2, Channel 1 upper, Channel 3 lower position.

Which ONE (1) of the following describes the function provided by PZR level transmitter 1-RC-LT-461 under these conditions?

- a. Energizes the backup heaters on a high level deviation.
- b. Decreases charging flow on an increasing level.
- c. De-energizes the proportional and backup heaters on a low level.
- d. Automatically closes 1-CH-LCV-1460A on a low level.

75.

Given the following conditions:

- Reactor power was initially 100%.
- All CC flow has been lost to the RCPs and a reactor trip has been initiated.

Which ONE (1) of the following nuclear instrument indications would warrant entry into FR-S.1, "Response to Nuclear Power Generation/ATWS?"

- a. Intermediate range startup rate is +0.1 dpm.
- b. Power range indicates 3% and decreasing.
- c. Source range startup rate is +0.1 dpm.
- d. **NEITHER** source range channel is energized and intermediate startup rate is -0.1 dpm.

76.

Given the following plant conditions:

- Control Rod P-6 dropped into the core from 100% power.
- Unit 1 reactor power is presently at 70% after ramping following the dropped rod.
- The operating team has completed the ICCE brief and is ready to commence withdrawal of Control Rod P-6.
- The time since the rod dropped is 2 hours.

Which ONE (1) of the following identifies the maximum rod withdrawal rate while recovering the dropped rod?

- a. 72 steps per minute.
- b. 48 steps per minute.
- c. 3 steps per hour.
- d. 2 steps per hour.

77.

Which ONE (1) of the following can **NOT** supply a direct suction source of water to the Auxiliary Feedwater Pumps?

- a. 1-CN-TK-1, 110,000 Gallon Aboveground Emergency Condensate Storage Tank.
- b. 1-CN-TK-2, 300,000 Gallon Normal Condensate Storage Makeup Tank.
- c. 1-CN-TK-3, 100,000 Gallon Horizontal Emergency Makeup Tank via the AFW Booster Pumps.
- d. Fire Main.

78.

Given the following conditions:

- A turbine governor valve failed shut reducing power from 100% to 70% power.
- RCS Tavg is 567°F.
- PZR Pressure is 2265 psig.
- PZR Level is 51%.

Which ONE (1) of the following describes the expected condition of the proportional heaters and pressurizer spray valves?

	<b>PROPORTIONAL HEATERS</b>	<b>SPRAY VALVES</b>
a.	On	Open
b.	On	Closed
c.	Off	Open
d.	Off	Closed

79.

Following an accident, FR-C.2, "Response to Degraded Core Cooling," is being implemented.

After the performance of several steps in FR-C.2, the following Critical Safety Function Status Tree (CSFST) conditions are noted:

- Integrity - RED
- Core Cooling - RED
- Containment - ORANGE
- Heat Sink - YELLOW
- Subcriticality - YELLOW
- Inventory - YELLOW

Which ONE (1) of the following describes which action should be taken by the Operating Team?

- a. Remain in FR-C.2, "Response to Degraded Core Cooling," until completion and then recheck the CSFSTs.
- b. Transition to FR-C.1, "Response to Inadequate Core Cooling," due to the RED condition on Core Cooling.
- c. Transition to FR-P.1, "Response to Imminent Pressurized Thermal Shock," due to the RED condition on Integrity.
- d. Transition to FR-Z.1, "Response to High Containment Pressure," due to the ORANGE condition on Containment.

80.

The following events and actions occurred on Unit 1 in order:

- An unisolable Main Steam Line Break occurred on "A" S/G.
- Auxiliary Feedwater was isolated to "A" S/G.
- AMSAC has been reset to allow securing the Turbine-Driven Auxiliary Feedwater Pump.
- A Safety Injection has just initiated due to the Steam Line Break.
- An AFW MOV open signal is generated when SI is initiated.

Which ONE (1) of the following describes the actions required to close the "A" S/G AFW MOVs?

- a. No action is required. The "A" S/G AFW MOVs will remain closed due to "A" S/G low pressure.
- b. Immediately place both AFW MOV control switches in the closed position and release. Observe valve position indication until both valves are fully closed.
- c. Wait until the valves are full open, then place and hold both AFW MOV control switches in the closed position until valves are fully closed.
- d. Wait until the valves are full open then place both AFW MOV control switches in the closed position and release. Observe valve position indication until both valves are fully closed.

81.

Given the following conditions:

- The unit is operating at 100% power.
- Channel III PZR Pressure PT-457 is failed, with all bistables in the TRIPPED condition.
- An electrical fault occurs which results in a loss of Vital Bus 2.

Which ONE (1) of the following describes the impact that the loss of Vital Bus 2 has on the plant?

- a. A reactor trip occurs and BOTH trains of Safety Injection initiate.
- b. A reactor trip occurs, but ONLY Train "A" of Safety Injection initiates.
- c. A reactor trip occurs, but ONLY Train "B" of Safety Injection initiates.
- d. A reactor trip occurs, but NO SI occurs.

82.

Given the following conditions:

- Unit 1 is in Hot Shutdown.
- A loss of "F" Transfer Bus occurs.

Which ONE (1) of the following identifies plant equipment that is affected by the power loss?

- a.
  - 1-RC-P-1A, "A" Reactor Coolant Pump
  - 1-FW-P-1A, "A" Main Feed Pump
- b.
  - 1-RC-P-1B, "B" Reactor Coolant Pump
  - 1-FW-P-1B, "B" Main Feed Pump
- c.
  - 1-RC-P-1C, "C" Reactor Coolant Pump
  - 1-FW-P-1B, "B" Main Feed Pump
- d.
  - 1-CN-P-1B, "B" Condensate Pump
  - 1-FW-P-1A, "A" Main Feed Pump

83.

Given the following plant conditions:

- A Large Break LOCA has occurred on Unit 1.
- 1-FR-Z.2, "Response to Containment Flooding," has been initiated due to high water level in Containment.

Which ONE (1) of the following pipe breaks would result in the highest water level inside Containment if the leakage cannot be isolated?

- a. Component Cooling header to the Residual Heat Removal Heat Exchanger.
- b. Service Water header to the "B" Recirc Spray Heat Exchanger.
- c. Containment Primary Grade Water header.
- d. Unit 2 RWST via the crosstie line.

84.

Given the following plant conditions:

- Unit 1 is operating at 100% power.
- A fault on the “B” DC bus initiates a loss of “B” DC bus.

Which ONE (1) of the following is NOT an action that occurs due to the loss of the “B” DC bus?

- a. The reactor trips due to loss of power to “B” reactor trip breaker undervoltage coil.
- b. #3 EDG auto-starts due to loss of power to the undervoltage detection circuit.
- c. Annunciators F through K are de-energized due to loss of power to control circuit.
- d. 4KV breakers on “B” Station Service Bus lose control power.

85.

Which ONE (1) of the following describes the correct lineup and operation of the Liquid Waste System?

- a. Both High Level Waste Tank Pumps can take suction on both High Level Waste Tanks through a suction crosstie valve and trip off on high level in the High Level Waste Tanks.
- b. Both High Level Waste Tank Pumps can take suction on both High Level Waste Tanks through a suction crosstie valve and trip off on low level in the High Level Waste Tanks.
- c. The High Level Waste Tank Pumps can take suction on either the High Level Waste Tank or the Low Level Waste Tank through suction line crosstie valves and trip off on high level in the High Level or Low Level Waste Tanks.
- d. The High Level Waste Tank Pumps can take suction on either the High Level Waste Tank or the Low Level Waste Tank through suction line crosstie valves and trip off on low level in the High Level or Low Level Waste Tanks.

86.

Given the following conditions:

- The plant is being started up.
- The operator is in the process of shifting feedwater from bypass control to Main Feed Regulating Valve Control with the Main Feed Regulating Valves and Feed Water Bypass Valves all throttled open.
- A Reactor Trip occurs.
- RCS Tavg stabilizes at no load Tavg.

Which ONE (1) of the following identifies the expected position of the Feed Water Regulating Bypass Valves (FRBVs) and the Feed Water Regulating Valves (FRVs)?

	FRBVs	FRVs
a.	Open	Open
b.	Open	Closed
c.	Closed	Open
d.	Closed	Closed

87.

A loss of Component Cooling to the Containment Air Recirc Fans results in Containment temperature increasing from 95°F to 125°F.

Which ONE (1) of the following describes the effects on indicated pressurizer level if actual level in the pressurizer is held constant?

- Increases due to reference leg heating effects of increasing Containment temperature.
- Decreases due to reference leg heating effects of increasing Containment temperature.
- Does not change because indicated pressurizer level is not affected by Containment temperature.
- Does not change because the mass change due to reference leg heating is displaced back into the pressurizer.

88.

Given the following conditions:

- Unit 1 is in Hot Shutdown.
- The Reserve Station Transformers are supplying all Unit 1 4KV buses.
- A severe short has resulted in a loss of the Unit 1 "B" DC Bus.

Which ONE (1) of the following describes the response of the emergency diesel generators (EDGs)?

	#1 EDG	#3 EDG
a.	Starts and Loads	Does NOT start
b.	Does NOT start	Starts and Loads
c.	Does NOT start	Starts, but does NOT Load
d.	Starts, but does NOT Load	Starts and Loads

89.

Given the following conditions:

- The unit is operating at 80% power.
- A misaligned rod in Group 2 of Control Bank "D" has occurred.
- A recovery of the misaligned rod has just begun.
- Annunciator G-A-6, ROD CONT SYSTEM URGENT FAILURE, has just alarmed.

Which ONE (1) of the following indicates the cause of the "Urgent Failure" alarm?

- a. IRPI/Group step counter deviation.
- b. Rod sequencing error.
- c. Improper bank overlap with the "Rod Control Mode Select" switch in the bank select position.
- d. The lift coils of the remaining rods in "D" bank are de-energized.

90.

Which ONE (1) of the following is the specified method for performing independent verification of a locked closed manual valve?

- a. Verify that the lock is installed on the correct valve and properly locked.
- b. Remove the lock, attempt to turn the valve handwheel in the closed direction, reinstall the locking device.
- c. Attempt to move the valve handwheel in the open direction with the lock installed.
- d. The verifier must observe the initial valve operations and placement of the locking device.

91.

Given the following conditions:

- The unit has just experienced a reactor trip.
- NO SI equipment has actuated.
- 2 turbine stop valves are shut.
- 3 turbine governor valves are shut.
- RCS pressure is 1860 psig.
- Tavg is 542°F.
- All MSTVs are open.
- SG Pressures and Steam Flows are:

<u>SG</u>	<u>PRESSURE</u>	<u>STEAM FLOW</u>
"A"	925 psig	$0.1 \times 10^6$ lbm/hr
"B"	935 psig	$0.1 \times 10^6$ lbm/hr
"C"	845 psig	$1.3 \times 10^6$ lbm/hr

Which ONE of the following identifies the status of the turbine trip (1), and the automatic SI requirement (2)?

- |    | <u>(1)</u>  | <u>(2)</u>    |
|----|-------------|---------------|
| a. | tripped     | NOT required. |
| b. | tripped     | required.     |
| c. | NOT tripped | NOT required. |
| d. | NOT tripped | required.     |

92.

Given the following conditions:

- A reactor trip occurred due to a loss of offsite power.
- The plant is being cooled down on RHR per 1-ES-0.2, "Natural Circulation Cooldown."
- RVLIS upper range indicates greater than 100%.
- All CRDM fans have been running during the entire cooldown.
- RCS cold leg temperatures are 190°F.
- Steam generator pressures are 50 psig.

Which ONE (1) of the following indicates why steam should be dumped from all SGs?

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

93.

Given the following conditions:

- The unit is operating at 100% power.
- A release is in progress from Waste Gas Decay Tank "A".
- A loss of power to the process vent particulate radiation monitor occurs.
- "A" Process Vent Blower is in service.

Which ONE (1) of the following describes how the release is affected as a result of the loss of power?

- a. Automatically terminates.
- b. Must be manually terminated.
- c. Unaffected.
- d. Must be realigned through the "B" Process Vent Blower.

94.

Which ONE (1) of the following conditions related to the Pressurizer would require entry into a Technical Specification action statement?

- a. Pressurizer level is 68% with the plant operating at 8% power.
- b. Pressurizer pressure is 2185 psig at 45% power.
- c. "A" Pressurizer heater group breaker trips open.
- d. 1-RC-PCV-1455A controller is in manual.

95.

Given the following conditions:

- The unit is operating at 75%.
- Rod Control is in AUTO.
- Bank "D" control rods are at 195 steps.
- Tref is 566.9°F.
- Loop Tavgs are:

<u>LOOP</u>	<u>T-AVG</u>
"A"	569°F
"B"	567°F
"C"	566°F

Which ONE (1) of the following failures will cause control rods to step inward?

- a. Loop A Thot fails high
- b. Loop A Tcold fails low
- c. Loop B Tcold fails high
- d. Loop C Thot fails low

96.

Given the following conditions:

- The unit is operating at 30% power.
- A dropped control rod has just been re-aligned.
- While attempting to reset the Rod Control Urgent Failure alarm, the operator inadvertently pushes the Rod Control STARTUP button.

Which ONE (1) of the following describes the effect of operating the incorrect button?

- a. Only Control Bank control rods drop into the core, causing an automatic reactor trip.
- b. All rods, including Control Bank and Shutdown Bank rods, drop into the core, causing an automatic reactor trip.
- c. All rods remain in their current position and there is NO effect on the Rod Control System circuitry.
- d. All rods remain in their current position, but the Rod Control System circuitry senses all rods are fully inserted.

97.

The following conditions exist on Unit 1:

- "J" 4160 Volt emergency bus is de-energized due to a fault on the bus.
- A Hi-Hi CLS is initiated due to a Large Break LOCA occurring after "J" Bus was de-energized.

Which ONE (1) of the following describes the Service Water (SW) alignment to the Recirc Spray Heat Exchangers (RSHXs)?

- a. All RSHXs will have SW aligned since all SW flowpaths are parallel and redundant.
- b. One Inside RSHX and one Outside RSHX will have SW flow aligned through them.
- c. Both Inside RSHXs will have SW flow aligned through them.
- d. Both Outside RSHXs will have SW flow aligned through them.

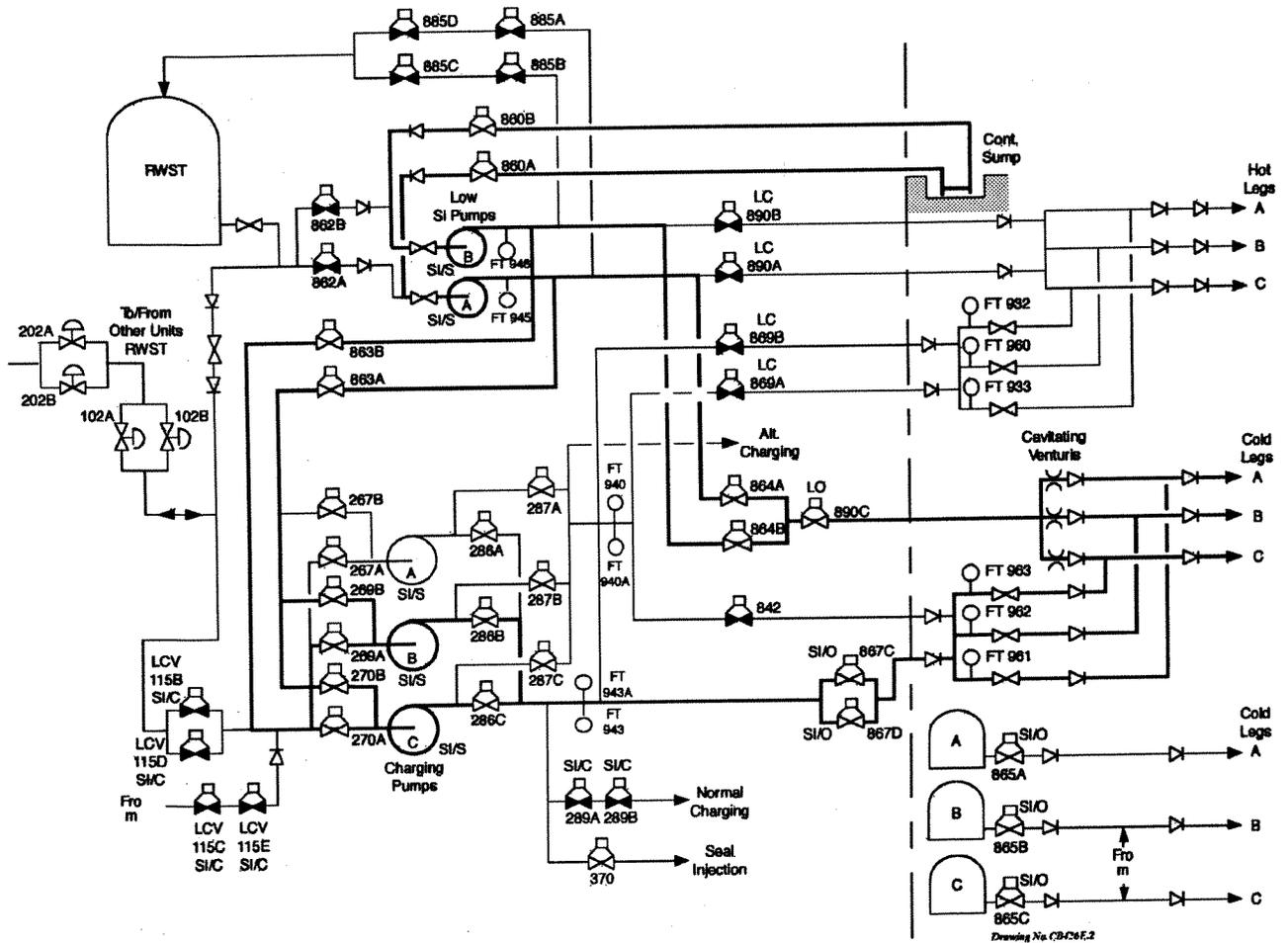
98.

Which ONE (1) of the following combinations of Radiation Monitors will automatically isolate Containment Purge on a High Radiation Alarm?

- a. RM-161, Containment Hi Range Gamma Area Monitor (or) GW-RI-101, Process Vent Particulate Monitor.
- b. RM-162, Manipulator Crane Area Monitor (and) RM-163, Reactor Containment Area Monitor.
- c. RM-162, Manipulator Crane Area Monitor (or) RM-RI-159, Containment Particulate Monitor.
- d. GW-RI-102, Process Vent Gas Monitor (and) RM-RI-160, Containment Particulate and Gas Monitor.

99.

Given the following drawing containing an ECCS alignment:



Which ONE (1) of the following describes the ECCS alignment?

- a. Cold leg injection
- b. Cold leg recirculation
- c. Hot leg injection
- d. Cold leg redundant flowpath

100.

Given the following conditions:

- A Large Break LOCA has occurred.
- 1-E-1, "Loss of Reactor or Secondary Coolant," is being implemented.
- The Unit SRO directs you to "Verify Cold Leg Recirculation Capability."

Which ONE (1) of the following describes the actions permitted during performance of "Verifying Cold Leg Recirculation Capability"?

- a. Restoring a flowpath from the containment sump to the LHSI pumps.
- b. Aligning a flowpath from the LHSI pumps to the HHSI pumps.
- c. Restoring power to SI valves that operate during Recirc Mode Transfer.
- d. Aligning a flowpath from SI pumps to the hot legs.