U.S. NUCLEAR REGULATORY COMMISSION REGION I
OPERATOR LICENSING EXAMINATION REPORT

EXAMINATION REPORT NOS. 90-21/20(OL)

FACILITY DOCKET NOS. 50-317/318

FACILITY LICENSE NOS. DPR-53/69

LICENSEE: Baltimore Gas and Electric Company

FACILITY: Calvert Cliffs Nuclear Power Plant

EXAMINATION DATES: October 29 and 30, 1990

CHIEF EXAMINER: David Silk — 12/5/90
David Silk, Senior Operations Engineer — Date

APPROVED BY: Dat Bissett for PWE — 12/6/90
Peter Eselgroth, Chief — Date
PWR Section, Operations Branch
Division of Reactor Safety

SUMMARY:

Initial examinations were administered to two reactor operator (RO) and one senior reactor operator (SRO) instant candidates. One RO candidate failed the simulator portion of the examination. The other operators passed all portions of the examination and were issued licenses.

DETAILS

TYPE OF EXAMINATIONS: Initial

EXAMINATION RESULTS:

	RO Pass/Fail	SRO Pass/Fail	TOTAL Pass/Fail
Written	2/0	1/0	3/0
Simulator	1/1	1/0	3/0
Walk-through	2/0	1/0	3/0
Overall	1/1	1/0	2/1

1.0 NRC PERSONNEL ON SITE:

Chief Examiner

David M. Silk, Senior Operations Engineer

Other Examiners

James Trapp, Senior Reactor Engineer, NRC
Ivan Kingsley, Sonalysts Inc.
Gary Weale, Sonalysts Inc.

2.0 PRE-EXAMINATION ACTIVITIES:

The reference material requested for this examination was received in a timely manner by both the NRC and the NRC contractors. Almost three weeks prior to the administration of the written examination, licensee personnel reviewed the written examinations with the chief examiner and the contractor examiner (author). The three licensee reviewers signed security agreements prior to commencing the review. The examinations were reviewed for technical accuracy and clarity. Licensee comments were incorporated as appropriate.

During the week of the examination while the written examinations were in progress, the NRC dry-ran the simulator scenarios planned for the next

day. Licensee personnel operating the simulator signed pre-examination security agreements prior to reviewing and dry-running the scenarios. Minor modifications were made as necessary to produce valid simulator examinations.

3.0 WRITTEN EXAMINATION:

Generic Weaknesses

Provided below are a list of generic weaknesses identified from the grading of the written examination. (NOTE: A weakness is defined when 50% or greater of the possible points for a given question are missed by the candidates.) This information is being provided to assist in upgrading initial and requalification training programs. No licensee response to these items is required.

RO#/SRO#	KNOWLEDGE/ABILITY
11/NA	Determination of operability based upon identification of exceeded surveillance intervals
23/NA	Knowledge of selected component responses to a total loss of instrument air
54/NA	Reason for containment cooling units shifting to low speed and high service water flow for a main steamline rupture inside containment
59/77	Knowledge of the correct RCP lineup for a LOCA with provided RCS and containment conditions
71/91	Knowledge of atmospheric steam dump valves response to provided plant conditions

4.0 OPERATING EXAMINATION:

Provided below are a list of weaknesses identified from the grading of the operating examination. This information is being provided to assist in upgrading initial and requalification training programs. No licensee response to these items is required.

One of the candidates was confused about the initial temperature used to determine if a 100 F per cooldown is in progress. The candidate thought that it was from the highest operating temperature within the last hour instead of the no-load temperature.

One of the candidates did not complete Step I of EOP-6, Steam Generator Tube Rupture. The title of the step is Identify and Confirm Affected S/G. The first substep of this step directs the operator to identify the ruptured steam generator. After identifying the ruptured steam generator, the candidate did not complete the subsequent substeps of Step I which ensure that the affected S/G is isolated.

5.0 EXIT MEETING ATTENDANCE:

NRC Personnel:

David Silk, Senior Operations Engineer
James Trapp, Senior Reactor Engineer

Calvert Cliffs Personnel:

J. R. Hill, AGS - Operations Training
L. P. Strayer, GS - OPS Representative
Marvin Coon, Supervisor - Initial Training
Raymond J. Hoffman, Coordinator - Initial Training

6.0 SUMMARY OF COMMENTS MADE AT EXIT MEETING ON OCTOBER 30, 1990

The NRC expressed appreciation for the cooperation and support of the licensee's training personnel who were involved in the examination development and administration.

Based on the performance of three simulator scenarios, the NRC stated that the simulator generally performed well and did not "lock-up" once. The following observations were made regarding the simulator for information purposes to assist the licensee in maintaining and/or upgrading simulator performance.

Unrelated to the inserted malfunctions, alarms associated with the RCPs and the steam generator feed pumps appeared on the monitor.

The metroscope was not providing any information regarding CEA location after the simulator was set up for the second scenario.

The simulator's copy of Technical Specifications contained two incorrect pages due to improper updating.

The crew exhibited good communications by loud and clear statements followed by repeat-backs from the recipient(s). Also, there were no generic deficiencies observed among the candidates during the simulator examinations.

One of the candidates did not complete Step I of EOP-6, Steam Generator Tube Rupture. The title of the step is Identify and Confirm Affected

S/G. The first substep of this step directs the operator to identify the ruptured steam generator. After identifying the ruptured steam generator, the candidate did not complete the subsequent substeps of Step I which ensure that the affected S/G is isolated. While discussing this item with training personnel, the licensee stated that this same mis-action has occurred at this step before with other operators and that the procedure upgrade group will be informed of this item.

During the plant walk-through, one candidate was loosely implementing guidance regarding the method of fast borating. OI-2B states to borate 5 - 10 seconds approximately every 5 minutes. The candidate stated that training permitted borating every 2 - 3 minutes for up to 15 seconds. It is understood that the procedure is general guidance, but the candidates implementation was essentially increasing the boration rate by a factor of four when he basically doubled the boration time while halving the frequency.

During the walk-through exam while one candidate was checking a control room logic diagram (61-035-E), the examiner commented that portions of the print were unreadable. Other logic prints that were checked during the examination were readable. The licensee agreed to check with reproduction to replace the print.

ATTACHMENTS:

1. RO Written Examination Questions and Answer Key
2. SRO Written Examination Questions and Answer Key
3. Simulator Fidelity Report

ATTACHMENT 1

Master

U. S. NUCLEAR REGULATORY COMMISSION
REACTOR OPERATOR LICENSE EXAMINATION
REGION 1

FACILITY: Calvert Cliffs 1 & 2

REACTOR TYPE: PWR-CE

DATE ADMINISTERED: 90/10/29

CANDIDATE: RO

INSTRUCTIONS TO CANDIDATE:

Points for each question are indicated in parentheses after the question. To pass this examination, you must achieve an overall grade of at least 80%. Examination papers will be picked up four and one half (4 1/2) hours after the examination starts.

NUMBER QUESTIONS	TOTAL POINTS	CANDIDATE'S POINTS	CANDIDATE'S OVERALL GRADE (%)
85	100.00		

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

Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.

2. After the examination has been completed, you must sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination. This must be done after you complete the examination.

3. Restroom trips are to be limited and only one candidate at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.

4. Use black ink or dark pencil only to facilitate legible reproductions.

5. Print your name in the blank provided in the upper right-hand corner of the examination cover sheet.

6. Fill in the date on the cover sheet of the examination (if necessary).

7. You may write your answers on the examination question page or on a separate sheet of paper. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

8. If you write your answers on the examination question page and you need more space to answer a specific question, use a separate sheet of the paper provided and insert it directly after the specific question. DO NOT WRITE ON THE BACK SIDE OF THE EXAMINATION QUESTION PAGE.

9. Print your name in the upper right-hand corner of the first page of answer sheets whether you use the examination question pages or separate sheets of paper. Initial each of the following answer pages.

10. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.

11. If you are using separate sheets, number each answer and skip at least 3 lines between answers to allow space for grading.

12. Write "Last Page" on the last answer sheet.

13. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.

14. The point value for each question is indicated in parentheses after the question. The amount of blank space on an examination question page is NOT an indication of the depth of answer required.

15. Show all calculations, methods, or assumptions used to obtain an answer.

16. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK. NOTE: partial credit will NOT be given on multiple choice questions.

17. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.

18. If the intent of a question is unclear, ask questions of the examiner only.

19. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.

20. To pass the examination, you must achieve an overall grade of 80% or greater.

21. There is a time limit of (4 1/2) hours for completion of the examination. (or some other time if less than the full examination is taken.)

22. When you are done and have turned in your examination, leave the examination area as defined by the examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION: 001 (1.00)

In accordance with administrative procedures, which of the following evolutions may be performed without the applicable procedure present?

1. An ABO is going to charge Penetration Room canisters.

2. A CRO is going to add DI water to the quench tank.

3. A CRO is going to roll the Unit 1 main turbine.

a. 1. and 2. only

b. 2. and 3. only

c. 1. and 3. only

d. 1., 2. and 3.

QUESTION: 002 (1.00)

To verify the position of a FULLY OPEN manually-operated valve, the operator should:

a. fully close the valve, then reopen the valve to the fully open position.

b. operate the valve handwheel in the open direction; if the handwheel does not move, the valve is fully open.

c. operate the valve handwheel in the open direction until the valve is backseated one-half turn.

d. operate the valve handwheel in the close direction, then reopen the valve to the fully open position.

QUESTION: 003 (1.00)

In accordance with administrative procedures, for which one of the following reasons may the CRO leave the control room routine surveillance area without first being relieved?

a. Verify receipt of alarms and initiate corrective actions.

b. Complete control room logs and hang safety tags.

c. Conduct shiftly control room tour and communicate with CRS or SS.

d. Obtain controlled keys and review shift supervisor's log.

QUESTION: 004 (1.00)

A 23 year-old male licensed operator has the following exposure history:

Lifetime whole body dose (including current quarter) - 24.6 rem
Current quarterly whole body dose - 600 mrem

Assuming his exposure is properly documented, what is the maximum ADDITIONAL whole body exposure this operator can receive this quarter and still comply with 10 CFR 20?

a. 400 mrem

b. 625 mrem

c. 2400 mrem

d. 2625 mrem

QUESTION: 005 (1.00)

Unit 2 is increasing power from 70 percent to 100 percent. What indication should be used as the PRIMARY indication of reactor power during the power change?

a. Wide range logarithmic power channels

b. Power range Safety channels

c. RPS delta-T power channels

d. Secondary calorimetric power (plant computer)

QUESTION: 006 (1.00)

A reactor trip and safety injection has occurred on Unit 2. While monitoring SPDS, the STA notes that the CORE & RCS HEAT REMOVAL safety function block is yellow, but there is a small magenta block next to the yellow safety function block. What condition is indicated by the small magenta block?

a. Safety function status is inaccurate due to missing data.

b. Safety function status is being assessed with reduced logic.

c. Safety function is being assessed with invalid data.

d. Safety function status is yellow due to invalid data.

QUESTION: 007 (1.00)

Which one of the following combinations states the dose rate limits (in REM per hour) above which the associated area must be posted as an Exclusion High Radiation Area or a Locked High Radiation Area?

	Exclusion High Radiation Area	Locked High Radiation Area
a.	> 1	> 10
b.	> 10	> 1
c.	> 10	> 100
d.	> 100	> 10

QUESTION: 008 (1.00)

A supplementary clearance is used to:

a. expand the main clearance if the boundaries are found to be inadequate.

b. amend the main clearance to include additional work which can be performed within the existing boundaries.

c. modify the main clearance to allow partial restoration of the system.

d. transfer responsibility for a main clearance between different lead persons.

QUESTION: 009 (1.00)

Which one of the following types of work does NOT require a tagging clearance:

a. Troubleshooting an electrical circuit

b. Changing the oil on an air compressor

c. Removal/Reinstallation of fuses for an RMS functional test

d. Local leak rate testing of a containment penetration

QUESTION: 010 (1.00)

For the purposes of safety tagging, a high energy system is defined as:

a. A system containing liquids or gases at greater than 500 psig OR greater than 200 degrees F.

b. A system that operates at greater than 600 volts OR greater than 30 amps.

c. A system containing liquids or gases at greater than 500 psig AND greater than 200 degrees F.

d. A system that operates at greater than 600 volts AND greater than 30 amps.

QUESTION: 011 (1.00)

The past quarterly surveillance intervals on the pressurizer PORV block valves (STP-0-65-1) are as follows:

1. Completed satisfactorily today
2. Completed satisfactorily 89 days ago
3. Completed satisfactorily 189 days ago
4. Completed satisfactorily 303 days ago

During the above time period, how many days were the PORV block valves inoperable due to improper surveillance interval(s)?

a. 0

b. 4

c. 10.5

d. 30

QUESTION: 012 (1.00)

"Verbatim compliance", per CCI-300:

a. allows the CRO to use his judgement in determining how to implement a procedure.

b. requires the CRO to use approved procedures step-by-step, word-for-word.

c. allows the SS to make on-the-spot changes to approved procedures for convenience of operating.

d. is unnecessary for day-to-day operations if the operator uses journeyman knowledge.

QUESTION: 013 (1.50)

Unit 1 is operating at full power and Unit 2 is conducting refueling when a station blackout occurs. 12 CST level gradually decreases to 5 feet. List the THREE (3) alternate water sources available to provide suction to the Unit 1 AFW pumps in order of priority. Assume DI water is not available. (Answer on lines below.) (0.5 each)

1. (1st priority) _____

2. (2nd priority) _____

3. (3rd priority) _____

QUESTION: 014 (1.00)

Unit 1 is operating at rated power when a shutdown group CEA drops into the core (fully inserted). Assuming the reactor does not trip, what color status light(s) will be illuminated for the dropped CEA on the CEA mimic display?

a. Amber only

b. Amber and green only

c. Amber, green, and blue only

d. Amber, green, blue, and red

QUESTION: 015 (1.00)

Unit 2 is operating at 50 percent power during a load increase with 21 SGFP operating in automatic and 22 SGFP running in standby. The 21 SGFP trips, resulting in a low S/G level reactor trip and turbine trip. Why does AOP-3G (Malfunctions of MFW System) require the operator to feed the S/Gs using the AFW system instead of using 22 SGFP?

a. To minimize the possibility of overfilling the S/Gs.

b. To minimize the possibility of water hammer in the main feedwater system.

c. To minimize the possibility of thermal shock to the S/G feed ring J-tubes.

d. To ensure the most reliable source of feedwater is used to restore S/G level.

QUESTION: 016 (1.00)

Alternate action 2.3 of EOP-0 (Post-Trip Immediate Actions) requires the operator to verify SIAS actuation if RCS pressure decreases to 1725 psia. What is/are the minimum indication(s)/equipment actuation(s) that must be checked to verify SIAS actuation during implementation of EOP-0.

a. "ACTUATION SYS SIAS TRIPPED" annunciator

b. "ACTUATION SYS SIAS TRIPPED" annunciator, and HPSI pumps started

c. "ACTUATION SYS SIAS TRIPPED" annunciator, HPSI pumps started, and LPSI pumps started

d. "ACTUATION SYS SIAS TRIPPED" annunciator, and SI cold leg discharge valves open

QUESTION: 017 (1.00)

Upon determining that a control room evacuation is required (because of a control room fire) per AOP-9A (Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire), which one of the following operators is responsible for tripping the Unit 1 main turbine at the front standard.

a. Unit 1 RO

b. Unit 1 CRO

c. Unit 2 RO

d. Unit 2 CRO

QUESTION: 018 (1.00)

Unit 1 has experienced a main steam line rupture. Both S/Gs have been isolated per EOP-4 (Excess Steam Demand). The following conditions currently exist:

S/G A level - 100 inches and stable
S/G B level - 50 inches and stable
S/G A pressure - 800 psia and decreasing slowly
S/G B pressure - 680 psia and increasing slowly
S/G A steam flow - 0 lbm/hr
S/G B steam flow - 0 lbm/hr
RCS pressure - 1600 psig and increasing slowly
Loop 1 T-cold - 520 degrees F and decreasing slowly
Loop 2 T-cold - 500 degrees F and increasing slowly
1 RCP running in each loop

Which of the following describes current plant status.

a. S/G A is the affected S/G, the break is inside containment.

b. S/G B is the affected S/G, the break is outside containment.

c. S/G A is the affected S/G, the break is outside containment.

d. S/G B is the affected S/G, the break is inside containment.

QUESTION: 019 (1.00)

Unit 2 has experienced a loss of offsite power and is starting a cooldown on natural circulation. An atmospheric steam dump valve has just been opened to start the RCS cooldown. Which one of the following indications will provide the operators with the quickest RCS feedback from the atmospheric dump valve operation on the RCS?

a. RCS loop T-hot

b. RCS loop T-cold

c. Pressurizer level

d. S/G level

QUESTION: 020 (1.00)

The plant has been operating at rated power for more than two weeks. While reviewing his panels, the reactor operator notes that since his last review, the megawatt output meter has decreased by about 25 MW, while reactor power, T-ref, and T-avg have remained constant. Which one of the following is the most likely cause of this unnoticed output power/reactor power mismatch?

a. A large load reduction on the grid.

b. A feed excursion causing increased SG levels.

c. A leaking SG code safety valve.

d. An air leak in the main condenser.

QUESTION: 021 (1.00)

If the saltwater valve handswitches are NOT manipulated during a large-break loss of coolant accident, which one of the following describes the saltwater flow conditions through the COMPONENT COOLING heat exchangers during the accident?

a. Full flow during SI injection phase; throttled flow during recirculation phase

b. No flow during SI injection phase; throttled flow during recirculation phase

c. Full flow during SI injection phase; full flow during recirculation phase

d. No flow during SI injection phase; full flow during recirculation phase

QUESTION: 022 (3.00)

Unit 2 has experienced a steamline rupture and is currently implementing EOP-4 (Excess Steam Demand). In addition to the MSIVs and MSIV bypass valves, list SIX (6) other sets of valves that must be shut to isolate the S/Gs. (0.50 each)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

QUESTION: 023 (3.00)

For each of the components in column A, select the proper component response from column B for a total loss of instrument air (IA) pressure. Assume each component was in operation when IA was lost. (Items in column B may be used once, more than once, or not at all. However, each blank in column A has only one answer.) (0.50 each)

Column A (COMPONENTS)	Column B (RESPONSE)
_____ a. Letdown pressure control valve	1. fails open/maximum flow
_____ b. Atmospheric dump valves	2. fails closed/no flow
_____ c. EDG service water supply valves	3. fails as is/ no change in flow
_____ d. Turbine AFW pump speed governor	4. no immediate effect/ system operates normally
_____ e. Pressurizer spray valves	
_____ f. AFW flow control valves	

QUESTION: 024 (1.00)

Select the basis for tripping all reactor coolant pumps after a total loss of all feedwater occurs.

a. Prevents RCP cavitation when the RCS reaches saturation conditions.

b. Prevents RCP seal damage when CIS actuates.

c. Reduces heat input to the RCS.

d. Reduces RCP motor damage from steam when once-through core cooling is initiated.

QUESTION: 025 (1.00)

A S/G tube rupture has occurred on Unit 1 and all RCPs have been stopped. Which one of the following is the reason for maintaining RCS subcooling between 25 degrees F and 35 degrees F during plant cooldown and depressurization on natural circulation?

a. This amount of subcooling will help to maintain pressurizer level above the heater cutout setpoint.

b. This amount of subcooling ensures sufficient NPSH for subsequent RCP start.

c. This amount of subcooling reduces the RCS leak rate into the S/G and prevents the possible lifting of a S/G safety valve.

d. This amount of subcooling prevents drawing a bubble in the reactor vessel head during depressurization.

QUESTION: 026 (1.00)

Which one of the following describes why EOP-4 (Excess Steam Demand) allows throttling HPSI flow to maintain a lower pressurizer level during the S/G blowdown phase than after the blowdown phase is completed?

a. To minimize the possibility of pressurizer overfill due to RCS heatup after blowdown is complete.

b. To ensure the pressurizer heaters stay de-energized, thus minimizing the possibility of pressurized thermal shock.

c. To ensure letdown flow remains at a minimum, thus reducing the mass loss from the RCS.

d. To minimize the amount of cold ECCS water that has to be charged into the RCS so that the excessive cooldown rate is not aggravated.

QUESTION: 027 (1.00)

Unit 1 is operating at rated power with all CEAs fully withdrawn and all systems operating normally. A regulating CEA drops to the bottom of the core but the reactor does not trip. In response to these conditions the operator should:

a. Adjust boron concentration to maintain T-cold.

b. Adjust turbine load as necessary to maintain T-cold.

c. Use regulating CEAs as necessary to maintain T-cold.

d. Manually trip the reactor.

QUESTION: 028 (1.00)

A reactor trip and turbine trip have occurred from rated power; no ESFAS actuations have occurred. The following conditions currently exist:

Reactor power: 1% and decreasing
All CEAs fully inserted
Pressurizer level: 50 inches and decreasing
Pressurizer pressure: 1715 psia and decreasing
S/G pressures: 785 psia and decreasing
RCS T-cold: 520 degrees F and decreasing
S/G levels: -150 inches and decreasing
Containment pressure: 0.8 psig and steady

Which of the following states the required operator actions for these conditions?

a. Verify safety injection, CIS, and trip all RCPs.

b. Verify safety injection, SGIS, and AFAS.

c. Block safety injection, throttle AFW flow and shut the MSIVs.

d. Verify safety injection, trip 2 RCPs, and shut the MSIVs.

QUESTION: 029 (1.00)

Following a reactor trip, an SPDS alarm is received on 2C03. The REACTIVITY block is yellow. The CEA mimic display reveals that all the CEAs are green with the exception of CEA 46, which indicates only red. This is an indication that CEA 46 is:

a. Still fully withdrawn.

b. Ejected from the core.

c. Not fully inserted.

d. At the Lower Electrical Limit.

QUESTION: 030 (1.00)

If a steam generator tube rupture occurs, the operator is not allowed to isolate the affected steam generator until RCS T-hot is less than 515 degrees F. Select the basis for this criterion.

a. Ensures subcooling margin is not lost when the ruptured S/G is isolated.

b. Ensures the ruptured S/G safety valve(s) will not lift after the ruptured S/G is isolated.

c. Prevents exceeding RCP trip criteria after the ruptured S/G is isolated.

d. Minimizes the RCS leak rate into the ruptured S/G before it is isolated.

QUESTION: 031 (1.00)

Unit 1 is operating at rated power with one charging pump running. Which one of the following provides positive indication that a charging pump header leak has occurred?

a. Decreasing pressurizer level with minimum letdown flow.

b. Charging header pressure greater than RCS pressure.

c. Charging header flow indication less than 44 gpm.

d. Charging header pressure less than RCS pressure.

QUESTION: 032 (1.00)

A station blackout has occurred. Select the condition below which is a direct indication of a void in the S/G tubes during natural circulation.

a. S/G pressure greater than RCS pressure.

b. Rapid increase in pressurizer level during a RCS pressure reduction.

c. Loss of RCS subcooled margin.

d. "REACTOR VESSEL WATER LEVEL LOW" alarm.

QUESTION: 033 (1.00)

Unit 1 is in Mode 6. Fuel movement is NOT in progress. Shutdown cooling is in operation with 12 LPSI pump running. Annunciator M-04 ("4KV ENG SF MOTOR OVERLOAD") is activated. During investigation, the Reactor Operator finds that 12 LPSI pump is not running. The NEXT operator action should be to:

a. restart 12 LPSI pump.

b. start 11 LPSI pump.

c. start 11 or 12 containment spray pump.

d. determine why 12 LPSI pump has stopped.

QUESTION: 034 (1.00)

After an extended loss of forced circulation in the RCS, one of the RCP restart criteria is T-cold less than 525 degrees F. The basis for this criterion is to ensure that:

a. the lower RCP seal temperature will be below 280 degrees F.

b. RCS subcooling is > 30 degrees F prior to RCP start.

c. there is adequate NPSP for the reactor coolant pump to operate.

d. S/G pressure will remain below the safety valve setpoint if a temperature transient occurs during RCP start.

QUESTION: 035 (2.00)

Unit 1 is operating at rated power. Match each of the following RCP seal pressure (psia) conditions in column A to the appropriate seal status in column B. (Column B items may be used once, more than once, or not at all. However, each blank in column A has only one answer.) (0.5 each)

Column A
(RCP SEAL CONDITIONS)

	RCS	MIDDLE SEAL	UPPER SEAL	VCT
_____ a.	2250	1050	1050	50
_____ b.	2250	1400	700	40
_____ c.	2250	1100	50	48
_____ d.	2250	2250	1100	45

Column B
(SEAL STATUS)

1. Normal
2. Lower Seal Failure
3. Middle Seal Failure
4. Upper Seal Failure
5. Lower and Middle Seal Failure
6. Middle and Upper Seal Failure

QUESTION: 036 (1.00)

A Unit 2 reactor trip has occurred. EOP-0 (Post-Trip Immediate Actions) is in progress. The Turbine Trip button has been depressed, but the 21 generator bus breaker (552-61) has remained closed and the turbine stop valves are still open. Which one of the following actions should be performed immediately per EOP-0?

a. Locally trip the turbine.

b. Open 21 generator bus breaker, 552-61.

c. Stop EHC pump(s).

d. Shut both MSIVs.

QUESTION: 037 (1.00)

The control room has been evacuated because of a fire in 1C02. Why is it necessary to remove the CLOSE fuses for a RCP breaker prior to locally opening the breaker?

a. To ensure the charging spring discharges.

b. To maintain the operability of the breaker "customer" trips.

c. To prevent breaker closing on a fault.

d. To ensure the breaker opens on interlock.

QUESTION: 038 (1.00)

While in Mode 3, identified leakage on Unit 1 increases to 9.4 gpm. Assuming that none of this leakage is due to S/G tube leaks, what ADDITIONAL primary-to-secondary leakage through the steam generators is allowed before Technical Specification action is required?

a. none

b. 0.6 gpm

c. 1.0 gpm

d. 1.6 gpm

QUESTION: 039 (1.00)

Unit 2 is operating at rated power when a valid "11/12 SERV WATER HEADER PRESS LO" alarm is received. AOP-7' (Loss of Service Water) is implemented. AOP-7B directs th perator to reduce heat load on the service water system by reducing main generator MVARs to zero. How does reducing MVARs reduce the heat load on service water?

a. Generator current is reduced which reduces generator heat generation.

b. Generator terminal voltage is reduced which reduces real load.

c. Hydrogen pressure increases which improves heat transfer.

d. Rotor windage heat generation is reduced.

QUESTION: 040 (1.00)

Unit 1 is operating at rated power when a reactor trip occurs. An operator observes that two CEAs failed to insert and begins borating per EOP-0 (Post-Trip Immediate Actions). Which one of the following is NOT required by EOP-0 to initiate a boration?

a. Open Boric Acid Direct Makeup Valve, 1-CVC-514-MOV.

b. Close VCT Outlet Isolation Valve, 1-CVC-501-MOV.

c. Start a boric acid pump.

d. Start all available charging pumps.

QUESTION: 041 (1.00)

Which one of the following describes the effect of placing the hand transfer valves for the AFW flow control valves in Position 2.

a. The valves will fail closed.

b. The valves will fail open.

c. Control air for the valves is aligned to the 1C43 controllers.

d. Control air for the valves is aligned to the control room controllers.

QUESTION: 042 (1.00)

Why is tr odium phosphate dodecahydrate (TSP) dissolved in containment sump water during a LOCA?

a. Minimize the possibility of corrosion cracking of metal components during operation of ECCS.

b. Minimize the possibility of cavitation at the suction of the ECCS pumps.

c. Minimize the amount of hydrogen generated by radiation-induced decomposition of the containment sump water.

d. Minimize the amount of boric acid required to be added to the RWT.

QUESTION: 043 (1.00)

Refer to figure 1. (Attached)

With the 12 S/G level transmitter isolation switch in the center/normal position, single-element feedwater control receives input from _____ and three-element feedwater control receives input from _____.

a. LT-1106; LT-1106

b. LT-1121; LT-1121

c. LT-1106; LT-1121

d. LT-1121; LT-1106

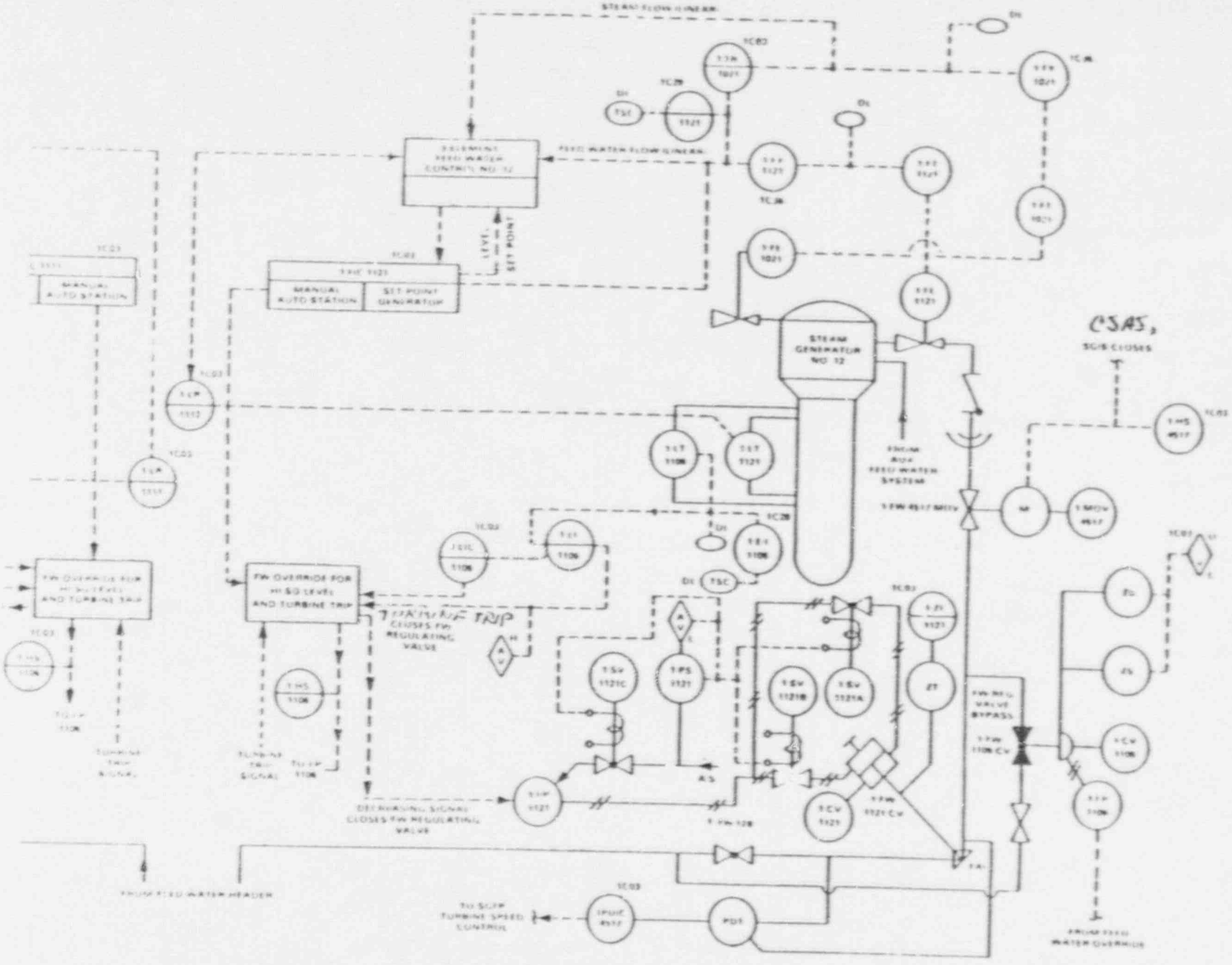

STEAM FLOW (LINEAR)
FEED WATER FLOW (LINEAR)
ELEMENT FEED WATER CONTROL NO 12
LEVEL SET POINT
MANUAL AUTO STATION
SET POINT GENERATOR
STEAM GENERATOR NO 12
FROM AUX FEED WATER SYSTEM
CSAS
SG/S CLOSES
FW OVERRIDE FOR HI SG LEVEL AND TURBINE TRIP
TURBINE TRIP CLOSES FW REGULATING VALVE
DECREASING SIGNAL CLOSES FW REGULATING VALVE
FW REG VALVE BYPASS
TO SUPPLY TURBINE SPEED CONTROL
PRESSURIZED WATER HEADER
FROM AUX FEED WATER SYSTEM

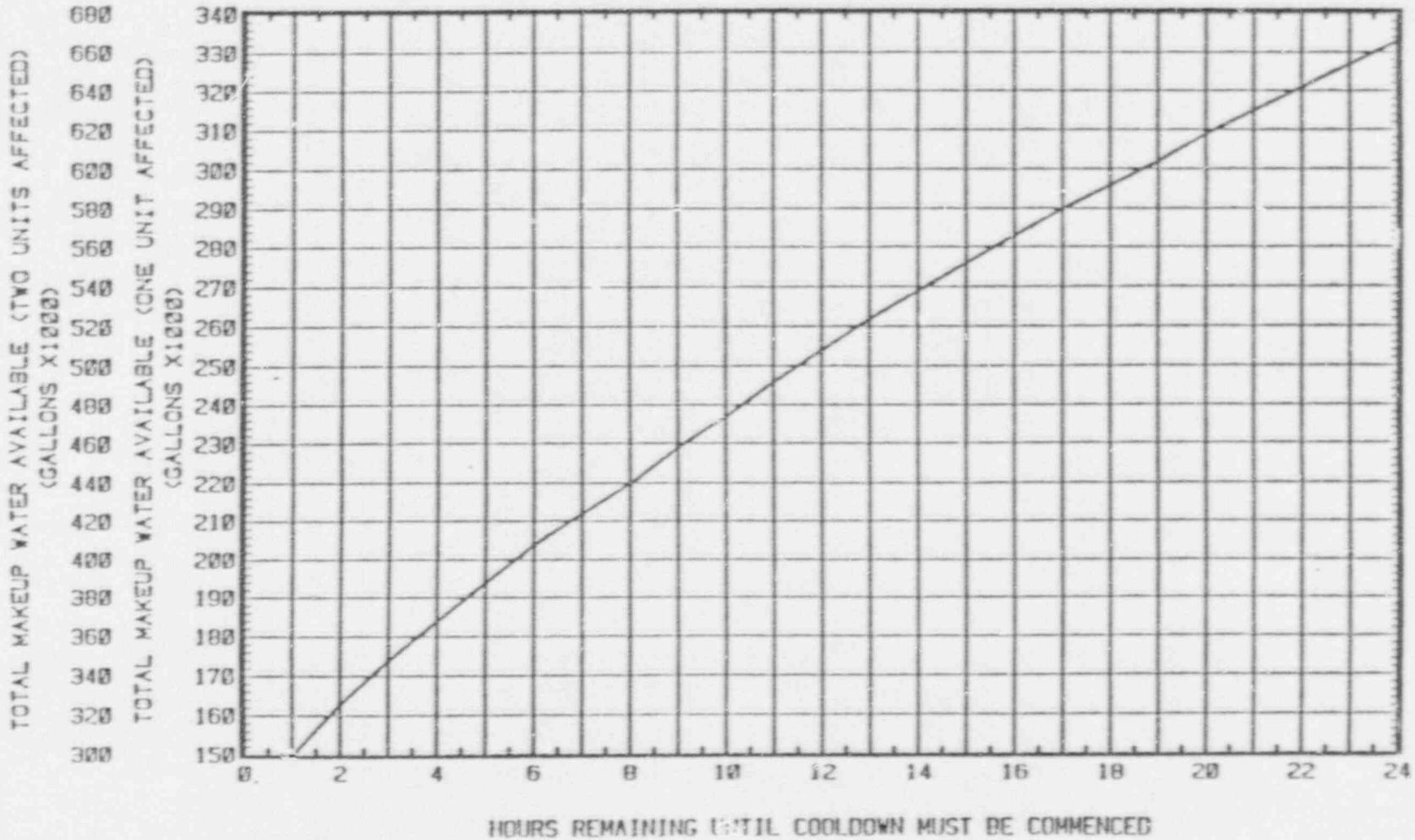
FIGURE 1

COOM CR
88-1137

MAKEUP WATER REQUIRED FOR RCS COOLDOWN

MAKEUP REQUIRED VS. TIME UNTIL RCS COOLDOWN IS COMMENCED

(1 FT. = 9636.78 GAL.)



QUESTION: 044 (1.00)

Refer to attachment 11.

Units 1 and 2 have suffered a loss of offsite power. The levels in the condensate storage tanks are as follows:

11 CST - 19 feet
12 CST - 32.5 feet
21 CST - 5.3 feet

How much time is left until cooldown is required to be commenced on both units?

a. 1.5 hours

b. 4.5 hours

c. 14.5 hours

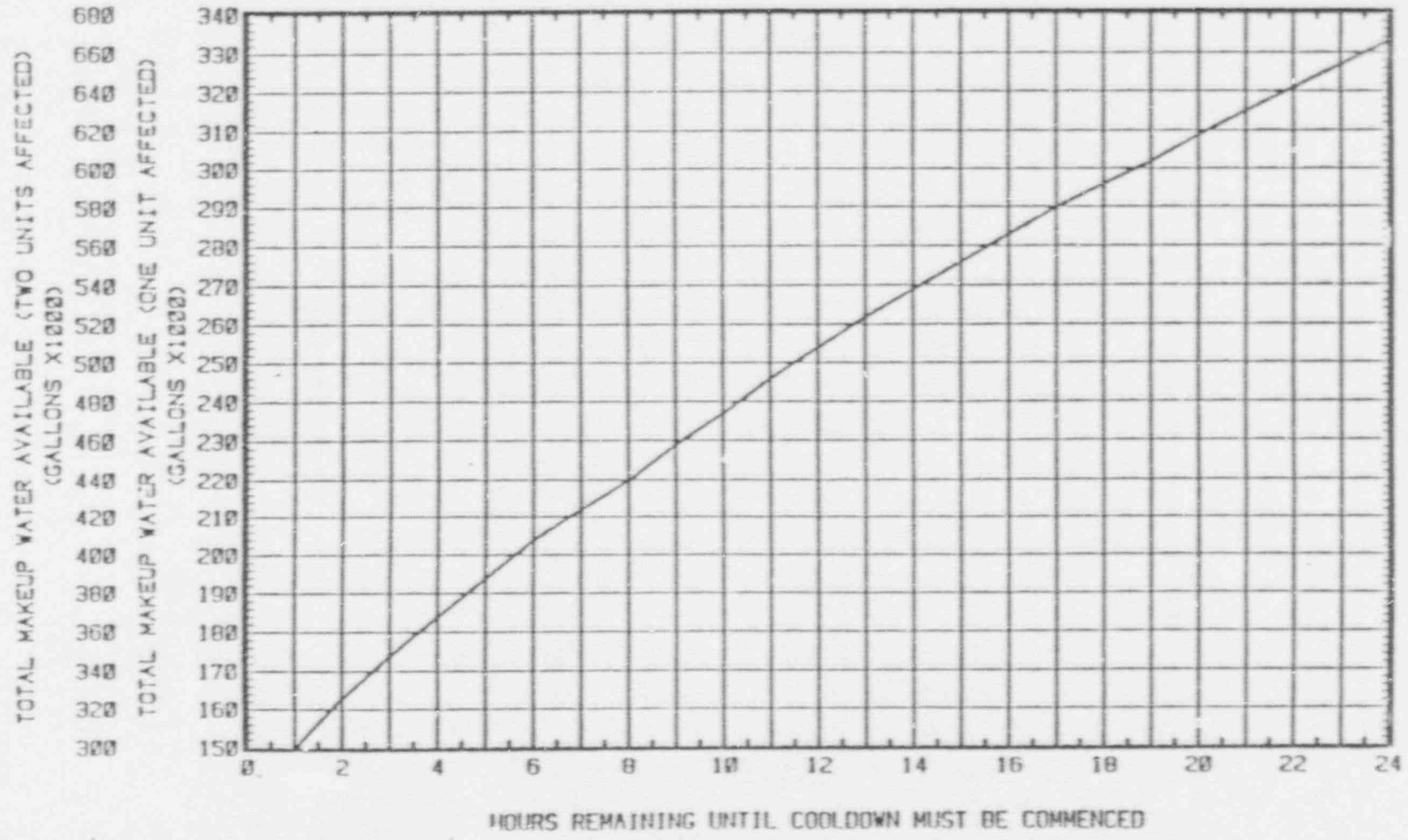
d. 20.5 hours

MAKEUP WATER REQUIRED FOR RCS COOLDOWN

MAKEUP REQUIRED VS. TIME UNTIL RCS COOLDOWN IS COMMENCED

(1 FT. = 9636.78 GAL.)

COMM CR
88-1137



ATTACHMENT (1)

ATTACHMENTS
REV. 1 /UNIT 1
PAGE 1 OF 1

QUESTION: 045 (1.00)

Unit 2 is operating at rated power when a switchyard fault occurs resulting in a loss of offsite power and a reactor trip. EOP-0 has been completed but natural circulation has not been verified yet. Which one of the following conditions would indicate that natural circulation flow has NOT been established?

a. Pressurizer level at 110 inches and decreasing

b. Steam generator pressures at 920 psig and increasing slowly

c. RCS subcooling at 18 degrees F and increasing slowly

d. Core differential temperature at 22 degrees F and decreasing slowly

QUESTION: 046 (1.00)

Unit 2 had been operating at rated power for one month when a reactor trip occurred. An ECC calculation was performed for a reactor startup with criticality estimated at 24 hours after the trip. Complications delayed restart another 12 hours and a second ECC calculation was performed. The desired critical CEA position was kept the same for both ECCs. Which one of the following statements describes the relationship between the two ECC calculations?

a. The second ECC requires a lower critical boron concentration due to the change in xenon reactivity.

b. The second ECC requires a higher critical boron concentration due to the change in xenon reactivity.

c. The second ECC requires a lower critical boron concentration due to the change in decay heat level.

d. The second ECC requires a higher critical boron concentration due to the change in decay heat level.

QUESTION: 047 (1.00)

A rupture in the SRW return line from 12 containment cooler will:

a. cause both SRW headers to drain because the Turbine Building return lines are normally cross-connected.

b. affect only the 12 SRW header because of the Auxiliary Building return line check valves.

c. cause both SRW headers to drain because the Turbine Building supply and return lines are normally cross connected.

d. affect only the 12 SRW header because of the Turbine Building return line check valves.

QUESTION: 048 (1.00)

Refer to page 23 of NEOP-11. (Attached)

Choose the value below which is closest to the value of azimuthal power tilt for the upper detectors of the power range NIs that read as follows:

Channel A = 99.5%
Channel B = 99.8%
Channel C = 98.2%
Channel D = 100.0%

a. 0.0044

b. 0.0058

c. 0.0066

d. 0.0073

- -

NOTE
The Azimuthal Power Tilt (Tq) can be calculated using the following formula:

$$Tq = \sqrt{\frac{[2(A-C)]^2 + [2(B-D)]^2}{(A+B+C+D)^2}}$$

Where: A, B, C, and D are the power range safety channel excore detector readings.

- -

6.2.3 CALCULATE an upper detector and a lower detector AZIMUTHAL POWER TILT (Tq) AND RECORD on the Unit Log Sheet.

6.2.4 DOCUMENT on the Unit Log Sheet that the tilts were hand calculated.

6.3 AZIMUTHAL POWER TILT (Tq) GREATER THAN 0.030 BUT LESS THAN OR EQUAL TO 0.10 (TS 3.2.4.a)

6.3.1 NOTIFY the PE-NE and AGS-NO that the indicated Tq is greater than 0.030 but less than or equal to 0.10.

6.3.2 PERFORM EITHER of the following:

*CORRECT the AZIMUTHAL POWER TILT (Tq) within two (2) hours, so that Tq is less than 0.030, OR

*DETERMINE and DOCUMENT on Attachment 11-6 within the next two (2) hours and at least once per subsequent eight (8) hours, that the Total Planar Radial Peaking Factor (F_{xy}^T) and the Total Integrated Radial Peaking Factor (F_r^T) are within the limits of TS 3.2.2.2 and 3.2.3.

QUESTION: 049 (1.00)

A dead bus transfer of the (11) 13KV bus from the SMECO Power Supply System to the BG&E grid is in progress. How long can the (11) 13KV bus remain deenergized before the lockout ("286" device for (11) 13KV bus) will trip?

a. 6 to 9 milliseconds

b. 0.6 to 0.9 seconds

c. 6 to 9 seconds

d. 60 to 90 seconds

QUESTION: 050 (1.00)

List TWO (2) readily available sources of borated makeup water to the refueling pool following a failure of the refueling pool seal. (0.5 each)

1. _____

2. _____

QUESTION: 051 (1.00)

Which one of the following cases meets the requirement for overriding a valid ESFAS signal?

a. To prevent an unwanted reactor trip

b. At the discretion of the SS or CRS

c. When directed by an approved procedure

d. When the signal interferes with normal operation

QUESTION: 052 (2.00)

For each of the following conditions (a., b., and c.), LIST the ESFAS signals (from those listed below) that should have actuated. Consider each condition separately. Each condition may have for its answer none, one, or several of the following actuation signals:

SIAS
CSAS
CIS
SGIS
RAS
AI.S

a. A steam-line break has occurred in containment and:

containment pressure = 7 psig
11/12 S/G levels = -145 inches and -160 inches
PZR pressure = 1800 psia
11/12 S/G pressures = 770 and 670 psia

b. A small-break LOCA has occurred and:

containment pressure = 3 psig
11/12 S/G levels = -50 inches and -50 inches
PZR pressure = 1745 psia
11/12 S/G pressures = 900 and 900 psia

c. A feedwater problem has occurred and:

containment pressure = 1 psig
11/12 S/G levels = -180 inches and -200 inches
PZR pressure = 2200 psia
11/12 S/G pressures = 720 and 650 psia

a. _____

b. _____

c. _____

QUESTION: 053 (1.00)

A LOCA results in a reactor trip and SIAS. The pressurizer empties and pressurizer pressure stabilizes at about 1150 psia. If pressurizer level is restored to 120 inches, which pressurizer heaters will automatically reenergize?

a. All Back-up and Proportional heaters.

b. Only the Proportional heaters.

c. Only the Back-up heaters (all sets).

d. Only two sets of Back-up heaters.

QUESTION: 054 (1.00)

Which one of the following describes why the containment cooling units are designed to shift to low speed and high service water flow for a main steamline rupture inside containment.

a. Low speed reduces electrical load on D/Gs if no off-site power is available, high service water flow limits containment pressure rise.

b. Low speed reduces the possibility of damage in an adverse containment atmosphere; high service water flow keeps the motor and fan cool.

c. Low speed reduces electrical load on D/Gs if no off-site power is available; high service water flow keeps the motor and fan cool.

d. Low speed reduces the possibility of damage in an adverse containment atmosphere; high service water flow limits containment pressure rise.

QUESTION: 055 (2.0)

List FOUR (4) automatic trips that will be active for the 12 diesel generator during a SIAS. (0.50 each)

1. _____

2. _____

3. _____

4. _____

QUESTION: 056 (1.00)

Unit 1 is operating at rated power when a reactor trip occurs and two CEAs fail to insert. With a current RCS boron concentration of 600 ppm, a boration should be performed until RCS boron concentration is at least:

a. 800 ppm

b. 1000 ppm

c. 1800 ppm

d. 2300 ppm

QUESTION: 057 (1.00)

Why is it necessary to depress the Precharge button on the computer inverter before shutting the battery input breaker during inverter startup?

a. Precharging minimizes the voltage and current transients which may occur when the breaker is shut.

b. Precharging causes the charging spring motor to operate to charge the closing spring.

c. Precharging disengages the breaker tripping mechanism in the event it was left engaged.

d. Precharging allows the inverter to be declared operable prior to completion of a 30-minute warmup period.

QUESTION: 058 (1.00)

Refer to attachment 12.

Which one of the following combinations of RCS pressure and HPSI head flow represent expected/allowed conditions for a single HPSI pump in service before RAS actuation during a LOCA?

a. 1000 psia and 180 gpm

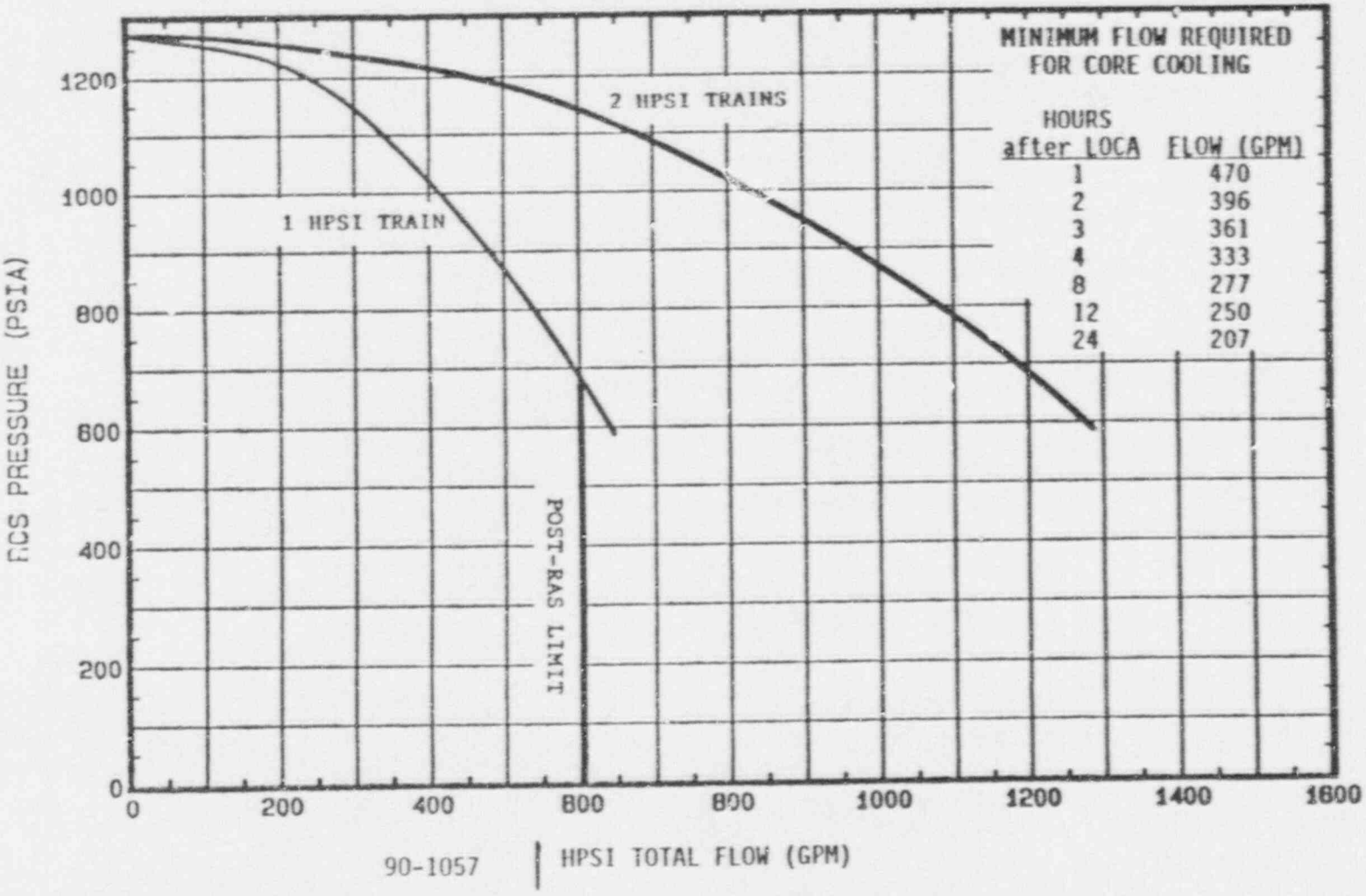
b. 900 psia and 480 gpm

c. 600 psia and 600 gpm

d. 225 psia and 800 gpm

HIGH PRESSURE SAFETY INJECTION FLOW

RCS PRESSURE VS. FLOW



90-1057

ATTACHMENT (12)

ATTACHMENT 8
REV. 1 / UNIT 1
PAGE 1 OF 1

QUESTION: 05? (1.00)

Refer to attachment 1.

A LOCA has occurred on Unit 2 with current plant conditions as follows:

RCS T-cold	- 450 degrees F
RCS pressure	- 600 psia
RCS subcooling	- 36 degrees F
Containment pressure	- 5 psig

According to the RCP trip strategy, the correct RCP lineup for this event is:

a. 2 pumps in the same loop.

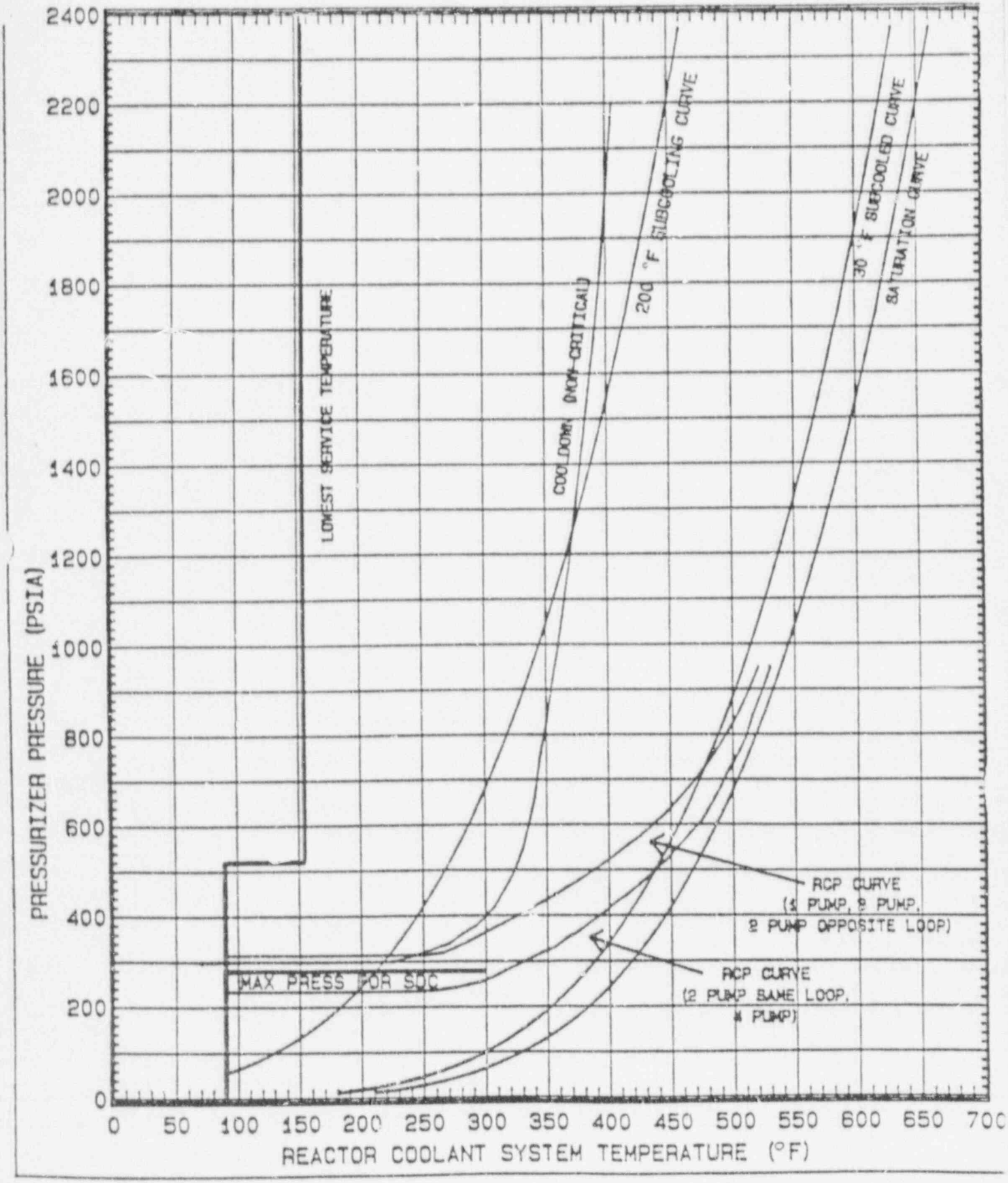
b. 2 pumps in opposite loops.

c. no pumps operating.

d. 2 pumps in the pressurizer loop.

RCS PRESSURE TEMPERATURE LIMITS

10-40 YEAR CURVE



QUESTION: 060 (1.00)

The Salt Water Air Compressors (SWACs) are used instead of the Instrument Air (IA) Compressors in the event of a severe control room fire because:

a. the SWACs do not require an external cooling source.

b. cooling water is available to the SWACs but not the IA compressors.

c. the ADVs are supplied by Salt Water Air.

d. the IA compressors may not start because of the Control Room fault.

QUESTION: 061 (1.00)

The normal lineup for #13 SRW pump, electrically and mechanically, is:

a. 14 4KV bus and 12 SRW header

b. 11 4KV bus and 11 SRW header

c. 14 4KV bus and 11 SRW header

d. 11 4KV bus and 12 SRW header

QUESTION: 062 (1.00)

The following indications on the Power Range Nuclear Instrumentation for Channel A are observed:

Upper Detector - 27%
Lower Detector - 33%

Which one of the following should be the indicated Channel A ASI?

a. -0.10

b. -0.01

c. +0.01

d. +0.10

QUESTION: 063 (1.00)

Unit 2 is operating at rated power when an inadvertent CSAS is generated. What prevents spray down of the containment?

a. The spray header isolation valves are closed because they require an SIAS to open.

b. The spray header isolation valves are closed because they require both CSAS and SIAS to open.

c. The containment spray pumps are stopped because they require an SIAS to start.

d. The containment spray pumps are stopped because they require both CSAS and SIAS to start.

QUESTION: 064 (2.00)

As pressurizer level is decreasing below the level setpoint, the pressurizer level control system starts the first backup charging pump at _____(a)_____ inches below the setpoint and the second backup charging pump at _____(b)_____ inches below the setpoint. As pressurizer level is returning to the level setpoint, the first backup pump is stopped at _____(c)_____ inches below the setpoint and the second backup pump is stopped at _____(d)_____ inches below the setpoint. (0.5 per blank)

(a) _____

(b) _____

(c) _____

(d) _____

QUESTION: 065 (1.00)

Which one of the following correctly states the RCS temperature inputs used in the thermal margin/low pressure (TM/LP) calculator to calculate delta-T power for use in the variable overpower trip unit?

a. Auctioneered high T-hot and auctioneered high T-cold

b. Auctioneered high T-hot and auctioneered low T-cold

c. Average T-hot and auctioneered low T-cold

d. Average T-hot and auctioneered high T-cold

QUESTION: 066 (1.00)

If Reactor Regulating System (RRS) channel X is initially selected, which one of the following correctly states the minimum actions that must be taken to obtain an accurate T-avg signal after a coincident failure of the in-use RTDs in the loop 1 hot leg and loop 1 cold leg.

a. Shift from RRS channel X to RRS channel Y.

b. Select RRS channel Y and shift selector switch HS-111 in the bottom section of 1C06.

c. Select OFF on the loop 1 selector switch for RRS channel X.

d. Shift selector switch HS-111 in the bottom section of 1C06.

QUESTION: 067 (1.00)

Unit 2 is operating at 60 percent power with a hot leg temperature of 590 degrees F. What will be the approximate reading on average core exit thermocouple temperature indication?

a. 566 degrees F

b. 578 degrees F

c. 602 degrees F

d. 614 degrees F

QUESTION: 068 (1.00)

A small feedline break has occurred inside Unit 1 containment and has resulted in containment temperature increasing from 100 degrees F to 160 degrees F. Disregarding any effects from RCS or containment pressure changes, what effect will this increase in containment temperature have on the pressurizer level indicated by LIC-110X/Y?

a. Indicated level will be higher than actual level because the reference leg fluid density decreases.

b. Indicated level will be lower than actual level because the reference leg fluid expands and spills back into the pressurizer.

c. Indicated level will be higher than actual level because the elevated containment temperature causes flashing in the reference leg.

d. Indicated level will be lower than actual level because of the high temperature effects on the differential pressure detector.

QUESTION: 069 (1.00)

Which one of the following describes the operation of the charging pumps when the Charging Pump Selector Switch on 1C07 is in the "13 and 11" position?

a. 13 - running, 11 - first backup, 12 - second backup

b. 12 - running, 11 - first backup, 13 - second backup

c. 13 and 11 - running, 12 - backup

d. 12 - running, 13 - first backup, 11 - second backup

QUESTION: 070 (1.50)

Match the Unit 1 nuclear instrumentation channels in column A to the appropriate type of detector from column B. (Items in column B may be used once, more than once, or not at all. However, each blank in column A has only one answer.) (0.5 each)

Column A (NIS CHANNEL)	Column B (DETECTOR)
_____ a. Wide Range Logarithmic	1. Self-powered neutron detector
_____ b. Power Range Control	2. Compensated ion chamber
_____ c. Power Range Safety	3. Uncompensated ion chamber
	4. Fission chamber
	5. Proportional detector

QUESTION: 071 (1.00)

Unit 1 is operating at rated power when a reactor trip occurs. The atmospheric steam dump valves quick-open and then modulate fully closed as T-avg decreases below 535 degrees F. If T-avg begins to increase above 535 degrees F again, how will the atmospheric steam dump valves respond?

a. The dump valves will immediately begin to modulate open until T-avg reaches 540 degrees F, at which time they will quick-open.

b. The dump valves will remain closed until T-avg reaches 540 degrees F, at which time they will begin to modulate open.

c. The dump valves will immediately begin to modulate open until T-avg reaches 557 degrees F, at which time they will be fully open.

d. The dump valves will remain closed until T-avg reaches 540 degrees F, at which time they will quick-open.

QUESTION: 072 (1.00)

A large break LOCA has occurred; the crew has implemented EOP-5 (Loss of Coolant Accident) and is now responding to an RAS actuation. What is the reason total HPSI flow must be limited to 1000 gpm when two HPSI pumps are operated after an RAS?

a. Minimizes the amount of coolant flowing out the break onto nearby equipment.

b. Minimizes the possibility of HPSI pump runout.

c. Minimizes the possibility of HPSI pump cavitation.

d. Minimizes the rate of level decrease in the containment sump.

QUESTION: 073 (1.00)

After a station blackout, which set of RCS temperatures confirms that natural circulation is occurring, per EOP-7 (Station Blackout)?

	T-Hot	T-Cold	Core Exit Thermocouple
a.	560	535	595
b.	530	485	535
c.	485	485	490
d.	450	375	455

QUESTION: 074 (3.00)

Assume that the 4kV emergency d[illegible]e generator (EDG) disconnect switches are lined up normally [illegible]o [illegible]t-power operations with all EDGs operable. For each of the fo[illegible]owing situations, fill in the associated blanks wi[illegible]h the following information.

(1) Which, if [illegible], 4kV EDGs will automatically start?

(2) Which, if a[illegible], 4kV EDGs will be automatically connected to a bus (i.e., the EDG feeder breaker will close)?

Situations: (ASSUME EACH SITUATION OCCURS SEPARATELY.)

a. 4kV bus 21 (only) suffers loss of voltage (no lockout).

b. 4kV buses 21 and 24 suffer loss of voltage (no lockout).

c. A loss of voltage (no lockout) occurs on 4kV buses 14 and 24 incident with a design-basis LOCA on Unit 2 (only).

	(1) EDGs THAT START	(2) EDGs AUTOMATICALLY CONNECTED
a.	_____	_____
b.	_____	_____
c.	_____	_____

Note: Your answer should either be specific EDG numbers or ALL or NONE. (0.5 each blank)

QUESTION: 075 (1.50)

When the Level 1 status light on a power range safety channel drawer illuminates, what THREE (3) protection signals are enabled or inhibited for that channel? (0.5 each)

(1) _____

(2) _____

(3) _____

QUESTION: 076 (1.50)

List THREE (3) interlocks that must be satisfied for a Reactor Coolant Pump (RCP) breaker to close when the RCP control switch is taken to START.

(0.5 each)

(1) _____

(2) _____

(3) _____

QUESTION: 077 (2.00)

List TWO (2) non-duplicate actions that occur in the Component Cooling Water system in response to each of the following FSFAS signals. (0.5 each blank)

a. CIS
(1) _____

(2) _____

b. SIAS
(1) _____

(2) _____

QUESTION: 078 (2.00)

Select the Volume Control Tank (VCT) level from column B which initiates each automatic control function in column A.
(0.5 each)
(Items in column B may be used once, more than once, or not at all. However, each blank in column A has only one answer.)

Column A (Automatic Control Function)		Column B (VCT Level)
____	a. Auto makeup starts	1. 112.5 inches
____	b. Auto makeup stops	2. 110 inches
____	c. Charging suction valves swap to RWT	3. 107.5 inches
		4. 90 inches
____	d. Diversion to Waste Processing starts	5. 87.5 inches
		6. 42.5 inches
		7. 10 inches
		8. 3 inches

QUESTION: 079 (1.00)

Unit 1 is in Mode 5 with the reactor vessel open and reactor temperature being maintained on shutdown cooling using 11 LPSI pump. Prior to draining Unit 1 RCS below the mid-plane of the hot leg, shutdown cooling flow shall be reduced to _____ gpm to preclude the possibility of _____ on 11 LPSI pump.

a. 1000; runout

b. 1000; air binding

c. 1500; runout

d. 1500; air binding

QUESTION: 080 (1.00)

After a reactor trip, a locked in actuation of AFAS A and B has occurred. The levels in 11 and 12 S/Gs are approximately -200 inches and slowly decreasing. The 11 S/G pressure is stable at 850 psia with motor-driven flow to 11 S/G steady at 150 gpm.

(CONSIDER EACH OF THE FOLLOWING QUESTIONS SEPARATELY.)

a. What pressure in 12 S/G will cause AFW flow to 12 S/G to automatically stop?

_____ psia (0.5)

b. If a pipe break occurs in the motor-driven flow path to 11 S/G, what pressure in that AFW line will actuate an annunciator to alert the operator to this failure?

_____ psia (0.5)

QUESTION: 081 (1.50)

Concerning the Waste Gas System,

a. What is the Technical Specifications limit on waste storage tank gas concentration that ensures the tank will not explode?

Gas _____ Limit _____ (0.5 each)

b. What waste storage tank parameter has a Technical Specifications limit that ensures public health and safety are not compromisod even if the tank does explode?

Parameter _____ (0.5)

QUESTION: 082 (1.00)

On a high activity level in the liquid waste discharge flow, the liquid waste effluent rad monitor (RM-2201) will cause the liquid waste discharge isolation valves (MWS-2201-CV and MWS-2202-CV) to automatically close. What additional condition will also cause an automatic liquid waste discharge flow isolation?

a. Low rad monitor sample flow

b. Rad monitor (RM-2201) failure

c. Discharge flow monitor failure

d. Loss of all circ water pumps

QUESTION: 083 (1.00)

When 120 vac vital bus 11 or 12 is powered from its backup bus, the associated EDG must be declared inoperable. What is the reason for this declaration?

a. Vital diesel auxiliaries are de-energized when the 120 vac vital bus is on backup.

b. Associated logic channels will not function to automatically start the diesel on a loss of power.

c. Associated logic channels will not function to automatically start the diesel on a SIAS.

d. On a loss of power with a loss of coolant accident the diesel will start but the LOCI sequencer will be de-energized.

QUESTION: 084 (1.00)

Unit 1 is operating at rated power and the Diverse Scram System performance evaluation is due. Which one of the following describes the effect of shutting the CEDM MG set bypass load contactors?

a. Shutting either CEDM MG set bypass load contactor will render the Diverse Scram System inoperable.

b. The Diverse Scram System will be inoperable only if both CEDM MG bypass load contactors are shut.

c. The Diverse Scram System is unaffected by the position of either CEDM MG bypass load contactor.

d. When the second CEDM MG set bypass load contactor is shut the "DSS LOAD CONTACTOR BYPASS" annunciator will alarm on 1C05.

QUESTION: 085 (1.50)

List THREE (3) non-duplicate containment building radiation monitors that are required by Technical Specifications to be operable when the unit is in Mode 1.

(0.5 each)

1) _____

2) _____

3) _____

(********** END OF EXAMINATION **********)

ANSWER: 001 (1.00)

a

REFERENCE:

Q#
CCI-300
GS-NO 85-1
LP-LOR-201-300-90, OBJ 1.2.1
4.1/3.9

194001A102 ..(KA's)

ANSWER: 002 (1.00)

d.

REFERENCE:

T# 1990/05/07
CCI-300J, p. 10
LO - None available
3.6/3.7

194001K101 ..(KA's)

ANSWER: 003 (1.00)

a.

REFERENCE:

T# 1990/05/07
CCI-305B, p. 2
LO - None available
3.1/3.4

194001K105 ..(KA's)

ANSWER: 004 (1.00)

a.

REFERENCE:

10CFR20
LO - None available
2.8/3.4

194001K103 ..(KA's)

ANSWER: 005 (1.00)

c.

REFERENCE:

T# 1990/05/07
GSNO SI 88-6
LO - None available
4.3/4.1
194001A113 ..(KA's)

ANSWER: 006 (1.00)

b

REFERENCE:

Q# B03201008
LP-LOR-201-8-89, OBJ 2.1.5
3.1/3.4

194001A115 ..(KA's)

ANSWER: 007 (1.00)

b.

REFERENCE:

T# 1988/12/06
OBJ - None available
CCI-800C, p. 18
2.8/3.4

194001K103 ..(KA's)

ANSWER: 008 (1.00)

b

REFERENCE:

Q# B02204016
LP-LOR-204-112-89, OBJ 4.1
3.7/4.1

194001K102 ..(KA's)

ANSWER: 009 (1.00)

c

REFERENCE:

Q# B03204019
STP-0-102-1
CCI-112
LP-LOR-204-112-89, OBJ 1.1
3.7/4.1

1940(1K102 ..(KA's)

ANSWER: 010 (1.00)

a

REFERENCE:

Q# B03204021
CCI-1121
LP-LOR-204-112-89, OBJ 1.2, 1.3
3.7/4.1

194001K102 ..(KA's)

ANSWER: 011 (1.00)

b

REFERENCE:

Q#
TS 4.0.2 LCO
TS 4.0.3 LCO
LP-LOR-204-1-88, OBJ 3.0
LP-LOR-201-3-1004-88, OBJ 2.15
3.1/4.1

194001A112 ..(KA's)

ANSWER: 012 (1.00)

b

REFERENCE:

Q#
LO 2.0
LOR-348-1-90
4.1/3.9

194001A102 ..(KA's)

ANSWER: 013 (1.50)

1. 11 CST
2. 21 CST
3. Firewater (0.4 for source, 0.1 for priority)

REFERENCE:

OBJ - None available
EOP-7, p. 12
4.5/4.4

000054A101 ..(KA's)

ANSWER: 014 (1.00)

c.

REFERENCE:

T# 1990/05/07
LP-RO-60-1-2, LO 2.01
LP-RO-60-1-2, p.28-30
SD-60, p. 28
3.7/3.9

000003A201 ..(KA's)

ANSWER: 015 (1.00)

b.

REFERENCE:

T# 1990/05/07
OI-12A, p. 4
LP-RO-103-1-0, p. 28, 29
LP-RO-103-1-0, LO 3.5
LER 84-03
4.4/4.6

000054K304 ..(KA's)

ANSWER: 016 (1.00)

b

REFERENCE:

OBJ - None available
EOP-0 Basis Document, page 8
3.8/3.9

000007G012 ..(KA's)

ANSWER: 017 (1.00)

a

REFERENCE:

OBJ - None available
AOP-9A, p. 10
4.1/4.2

000068G010 ..(KA's)

ANSWER: 018 (1.00)

b

REFERENCE:

OBJ - None available
EOP-4, step I.
4.2/4.7

000040A201 ..(KA's)

ANSWER: 019 (1.00)

c

REFERENCE:

OBJ - None available
EOP-2, page 3
3.8/4.0

000056A218 ..(KA's)

ANSWER: 020 (1.00)

d.

REFERENCE:

T# 1990/05/07
OBJ - None available
RO-202-7G-2 p. 9
2.6/2.9

000051G011 ..(KA's)

ANSWER: 021 (1.00)

b.

REFERENCE:

T# 1988/12/06
OBJ - None available
SD-38, p. 25,26
4.2/4.2

000011A111 ..(KA's)

ANSWER: 022 (3.00)

1. Feedwater isolation valves.
2. S/G blowdown valves.
3. AFW steam supply valves.
4. AFW block valves.
5. Atmospheric dump valves.
6. Main steamline upstream drains. (0.50 each)

REFERENCE:

OBJ - None available
EOP-4, p. 5
4.5/4.7

000040A104 ..(KA's)

ANSWER: 023 (3.00)

a. 2 (0.50 each)
b. 4
c. 1
d. 1
e. 2
f. 1

REFERENCE:

OBJ - None available
CC SDs #32, pg 15; #39, pg 21; #41, Fig A-7 to A-9
CC AOP-7D, pg 1
2.9/3.3

000065A208 ..(KA's)

ANSWER: 024 (1.00)

c

REFERENCE:

Q# B02005045
LP-LOR-201-3-88, OBJ 1.2
4.4/4.6

000054K304 ..(KA's)

ANSWER: 025 (1.00)

c

REFERENCE:

Q# B02005050
LP-LOR-201-6-88, OBJ 2.1
4.2/4.5

000038K306 ..(KA's)

ANSWER: 026 (1.00)

a

REFERENCE:

Q# B02007016
LP-LOR-201-4-1005-88, OBJ 2.11
LP-LOR-201-6-1002-88, OBJ 7.9
LP-LOR-201-322-3017B-0, OBJ 25.12
LP-LOR-322-3024A-1, OBJ 16.9
4.5/4.7

000040K304 ..(KA's)

ANSWER: 027 (1.00)

b

REFERENCE:

Q# B02060009
LP-LOR-202-3023A, OBJ 1.4 & 3.6
LP-LOR-322-30008C-1, OBJ 5.1
3.8/4.1

000003K304 ..(KA's)

ANSWER: 028 (1.00)

d

REFERENCE:

Q# B02063005
LP-LOR-201-3-1004-88, OBJ 2.20
LP-LOR-201-4-1005-88, OBJ 2.1
4.0/4.6

000007K301 ..(KA's)

ANSWER: 029 (1.00)

c

REFERENCE:

Q# B02069001
LP-LOR-202-9-88, OBJ 2.3
LP-LOR-69-1-88, OBJ 3.05
3.4/3.4

000005A105 ..(KA's)

NSWER: 030 (1.00)

b

REFERENCE:

Q# B02201016
LP-LOR-201-6-88, OBJ 2.2
4.2/4.5

000038K306 ..(KA's)

ANSWER: 031 (1.00)

d

REFERENCE:

Q#
LO 1.2
LOR-63-1-90
3.2/3.8

000022A201 ..(KA's)

ANSWER: 032 (1.00)

a

REFERENCE:

Q#
EOP-7
LP-LOR-201-7-89, OBJ 2.1
4.3/4.6

000055K302 ..(KA's)

ANSWER: 033 (1.00)

d

REFERENCE:

Q#
AOP-3B, Rev 8, page 12 of 17, caution under step 7
LP-LOR-202-3B-89, OBJ 2.3.1

3.9/4.3

000025K101 ..(KA's)

ANSWER: 034 (1.00)

d

REFERENCE:

Q#
EOP-2 and Basis document
EOP-7 and Basis document
LP-LOR-201-2-88, OBJ 9.1
LP-LOR-201-7-89, OBJ 3.3
4.4/4.7

000056K302 ..(KA's)

ANSWER: 035 (2.00)

a. 3
b. 1
c. 4 (0.5 each)
d. 2

REFERENCE:

Q# B02005032
OI-IA, Rev 13
LP-LOR-322-3008C-1, OBJ 2.3
LP-LOR-201-7-89, OBJ 5.3
4.0/4.2

000015A122 ..(KA's)

ANSWER: 036 (1.00)

d

REFERENCE:

LO 1.1
LOR-202-7A-90
U2 EOP-0
4.2/4.1

000007G010 ..(KA's)

ANSWER: 037 (1.00)

c

REFERENCE:

Q#
AOP-9A
LP-LOR-202-9A-2, OBJ 8.0
4.2/4.5

000068K318 ..(KA's)

ANSWER: 038 (1.00)

b

REFERENCE:

Q#
AOP-3B
TECH SPEC 3.4.6.2
LP-LOR-3B/6E-90, OBJ 1.2
3.1/3.9

000037G008 ..(KA's)

ANSWER: 039 (1.00)

a

REFERENCE:

Q#
AOP-7B
LO 1.2
LOR-202-7B-90, OBJ 1.2
4.0/4.2

000062K303 ..(KA's)

ANSWER: 040 (1.00)

b

REFERENCE:

OBJ - None available
EOP-0, p. 4
4.0/4.0

000024G010 ..(KA's)

ANSWER: 041 (1.00)

c

REFERENCE:

OBJ - None available
SD-34, AFW System, p. 12
3.7/4.3

000068K303 ..(KA's)

ANSWER: 042 (1.00)

a

REFERENCE:

OBJ - None available
U1 Tech. Specs. Bases, p, B5-2
2.5/3.8

026000G006 ..(KA's)

ANSWER: 043 (1.00)

c

REFERENCE:

LP-RO-103-1-0, OBJ 1.3, 1.4, 1.5
SD-32, p. 22
3.0/3.3

059000A211 ..(KA's)

ANSWER: 044 (1.00)

c

REFERENCE:

Q#
EOP-2, 7
EOP Attachment (11)
LP-LOR-201-1-90, OBJ 1.2
3.6/3.8

061000G013 ..(KA's)

ANSWER: 045 (1.00)

b

REFERENCE:

Q# B02005037
LP-301-1-88, OBJ 2.02
LP-201-6-1002-88, OBJ 7.12
4.3/4.5

002000A402 ..(KA's)

ANSWER: 046 (1.00)

b

REFERENCE:

Q# B02069002
LP-LOR-69-1-88, OBJ 2.01, 2.03
3.4/3.7

001010A201 ..(KA's)

ANSWER: 047 (1.00)

a

REFERENCE:

Q#
AOP-7B
LP-LOR-202-7B-90, OBJ 2.1
3.5/3.7

076000A201 ..(KA's)

ANSWER: 048 (1.00)

c

REFERENCE:

Q# B02206010
NEOG-2
LP-LOR-202-7H-89, OBJ 3.1
3.5/3.7

015000A104 ..(KA's)

ANSWER: 049 (1.00)

c

REFERENCE:

Q#
LO 1.3
LOR-200-27C&E-90
2.6/3.2

062000K401 ..(KA's)

ANSWER: 050 (1.00)

1. The unaffected unit's RWT (0.5 each)
2. The containment floor

REFERENCE:

OBJ - None available
Q#
LOR-202-3B/6E-90
2.9/3.7

034000A102 ..(KA's)

ANSWER: 051 (1.00)

c

REFERENCE:

Q#
LO 1.00
LOR-348-1-90
CCI-300
3.3/3.7

013000K410 ..(KA's)

ANSWER: 052 (2.00)

a. SIAS, CSAS, CIS, SGIS (0.25 each)

b. SIAS, CIS (0.25 each)

c. SGIS, AFAS (0.25 each)

REFERENCE:

OBJ - None available
SD-63 pp. 45-60 RO-34-1-2 pg. 7
3.8/3.9

012000A301 ..(KA's)

ANSWER: 053 (1.00)

d

REFERENCE:

Q#
LOR-201-5-88, OBJ 2.1
3.6/3.4

010000A402 ..(KA's)

ANSWER: 054 (1.00)

a

REFERENCE:

Q#
LOR-201-3-1004-88, OBJ 2.14
3.1/3.4

022000K402 ..(KA's)

ANSWER: 055 (2.00)

1. Overspeed
2. Lube oil pressure low
3. Crankcase High Pressure (Any 4 at 0.50 each)
4. Loss of Generator Field
5. CTCR (Cranking Timer Control Relay)
6. Generator Differential
7. Generator Underfrequency

REFERENCE:

Q#
LOR-201-6-1002-88, OBJ 7.16
3.9/4.2

064000K402 ..(KA's)

ANSWER: 056 (1.00)

d

REFERENCE:

Q#
LOR-322-3008C-1, OBJ 6.1
3.8/3.9

004010A207 ..(KA's)

ANSWER: 057 (1.00)

a

REFERENCE:

Q#
OI-26B
LP-LOR-54-1-89, OBJ 2.1a
3.1/3.5

062000K410 ..(KA's)

ANSWER: 058 (1.00)

b

REFERENCE:

Q#
EOP-5
Attachment 12
CEOG-NU0010
LP-LOR-201-3-1004-88, OBJ 2.24
LP-LOR-201-3031-89, OBJ 3a
LP-LOR-201-4-1005-88, OBJ 2.9
4.2/4.3

006030A102 ..(KA's)

ANSWER: 059 (1.00)

c

REFERENCE:

Q#
EOP-5
EOP Attachment 1
LP-LOR-201-7-89, OBJ 4.1
3.4/3.4

003000A107 ..(KA's)

ANSWER: 060 (1.00)

a

REFERENCE:

Q#
AOP-9A
LP-LOR-202-9A-2, OBJ 5.0
3.1/3.2

078000A301 ..(KA's)

ANSWER: 061 (1.00)

d

REFERENCE:

Q#
LO 1.3
LOR-202-7B-90
2.7/2.7

076000K201 ..(KA's)

ANSWER: 062 (1.00)

d

REFERENCE:

OBJ - None available
Tech. Specs., Pg 1-5
3.4/3.9

001000G001 ..(KA's)

ANSWER: 063 (1.00)

a.

REFERENCE:

T# 1988/12/06
LP-RO-07-1-1, p. 56
LP-RO-07-1-1, LO 04.K501
SD-7, figure 7-9
4.3/4.5

026000A301 ..(KA's)

ANSWER: 064 (2.00)

(a) 7
(b) 14 (0.5 each, all setpoints +/- 1)
(c) 4
(d) 6

REFERENCE:

T# 1990/05/07
OBJ - None available
SD 62 p. 15
3.2/3.3

011000A303 ..(KA's)

ANSWER: 065 (1.00)

d.

REFERENCE:

T# 1990/05/07
OBJ - None available
LP RO-59-1-4 p. 17
3.1/3.2

012000A205 ..(KA's)

ANSWER: 066 (1.00)

c.

REFERENCE:

T# 1990/05/07
OBJ - None available
LP RO-58-2-2 p. 12
3.0/3.1

016000A201 ..(KA's)

ANSWER: 067 (1.00)

b.

REFERENCE:

T# 1990/05/07
LP-RO-64-1-1, p. 15
LP-RO-64-1-1, 3.01a
LO - None available
3.8/4.1

017020A301 ..(KA's)

ANSWER: 068 (1.00)

a.

REFERENCE:

T# 1990/05/07
LP-RO-62-1-2, p. 9
LP-RO-62-1-2,
EOPs, attachment 9
LO - None available
3.7/3.8

011000A209 ..(KA's)

ANSWER: 069 (1.00)

d

REFERENCE:

T# 1990/05/07
SD-6, p. 25
LO - None available
3.8/3.4

004010A404 ..(KA's)

ANSWER: 070 (1.50)

a. 4
b. 3 (0.5 each)
c. 3

REFERENCE:

OBJ - None available
SD-57
2.9/3.2

015000K601 ..(KA's)

ANSWER: 071 (1.00)

b

REFERENCE:

OBJ - None available
SD-19, p. 18
2.7/2.9

041020K603 ..(KA's)

ANSWER: 072 (1.00)

c

REFERENCE:

OBJ - None available
EOP-3, Basis Document, p. 12
4.4/4.6

000011K312 ..(KA's)

ANSWER: 073 (1.00)

b

REFERENCE:

EOP-7, p. 7
4.4/4.6
000055A202 ..(KA's)

ANSWER: 074 (3.00)

	(1)	(2)
a.	12	None
b.	12 & 21	21
c.	ALL	21

REFERENCE:

SD-63, p. 114
4.1/4.0

064000A301 ..(KA's)

ANSWER: 075 (1.50)

(1) High SUR (inhibited)
(2) Loss of Load (enabled)
(3) APD (Axial Power Distribution) (enabled) (0.5 each)

REFERENCE:

SD-57, p. 44
4.3/4.5

015000K405 ..(KA's)

ANSWER: 076 (1.50)

(1) CCW flow switch (adequate)
(2) Oil lift pump (operating)
(3) Synchronizing stick (inserted)

REFERENCE:

SD-5, p. 21
2.8/3.1

003000K404 ..(KA's)

ANSWER: 077 (2.00)

a. (1) CCW Containment Isol Valves shut
(2) Liquid Waste Evaporator CCW Isol Valves shut (0.50 each)

b. (1) (Two) CCW pumps start
(2) SDC HX CCW outlet valves open
(3) CCW HX SWC Inlet/Outlet valves shut (any 2, 0.50 each)

REFERENCE:

SD-40, p.8, 96; SD-63, p. 163
3.6/3.7
008030A304 ..(KA's)

ANSWER: 078 (2.00)

a. 4
b. 3
c. 8
d. 2

REFERENCE:

SD-6, p. 21, fig 6-12
3.5/3.7
004000A301 ..(KA's)

ANSWER: 079 (1.00)

d

REFERENCE:

OI-3, p. 8
3.3/3.5
005000G010 ..(KA's)

ANSWER: 080 (1.00)

a. 735 psia
b. 675 psia

REFERENCE:

SD-34, pg. 49, 50, 51
3.5/3.7
061000K414 ..(KA's)

ANSWER: 081 (1.50)

a. Oxygen; 4% (0.5 each)
b. Radioactivity (0.5)

REFERENCE:

Tech Specs 3.11.2.5, 3.11.2.6
2.5/2.7

071000G010 ..(KA's)

ANSWER: 082 (1.00)

b

REFERENCE:

SD-14D, pp. 14, 15, 16
3.6/4.2
0730C0K301 ..(KA's)

ANSWER: 083 (1.00)

b

REFERENCE:

Q# B02054C03
LP-LOR-54-1-89, OBJ 1.2
3.6/3.8
013000K201 ..(KA's)

ANSWER: 084 (1.00)

a

REFERENCE:

Q# B(2060014
LP-LOR-344-2-89, OBJ 1.1, 1.1.1
4.4/4.6

001010A208 ..(KA's)

ANSWER: 085 (1.50)

1) Containment Hi Range ARMs
2) Containment Gaseous Activity (RCS leakage) (0.5 each)
3) Containment Particulate Activity (RCS leakage)

REFERENCE:

OBJ - None available
SD-15
2.9/3.5

072000G011 ..(KA's)

(********** END OF EXAMINATION **********)

Master

U. S. NUCLEAR REGULATORY COMMISSION
SENIOR REACTOR OPERATOR LICENSE EXAMINATION
REGION 1

FACILITY: Calvert Cliffs 1 & 2

REACTOR TYPE: PWR-CE

DATE ADMINISTERED: 90/10/29

CANDIDATE: SRO

INSTRUCTIONS TO CANDIDATE:

Points for each question are indicated in parentheses after the question. To pass this examination, you must achieve an overall grade of at least 80%. Examination papers will be picked up four and one half (4 1/2) hours after the examination starts.

NUMBER QUESTIONS	TOTAL POINTS	CANDIDATE'S POINTS	CANDIDATE'S OVERALL GRADE (%)
91	100.00		

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

Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the adm'nistration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.

2. After the examination has been completed, you must sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination. This must be done after you complete the examination.

3. Restroom trips are to be limited and only one candidate at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.

4. Use black ink or dark pencil only to facilitate legible reproductions.

5. Print your name in the blank provided in the upper right-hand corner of the examination cover sheet.

6. Fill in the date on the cover sheet of the examination (if necessary).

7. You may write your answers on the examination question page or on a separate sheet of paper. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

8. If you write your answers on the examination question page and you need more space to answer a specific question, use a separate sheet of the paper provided and insert it directly after the specific question. DO NOT WRITE ON THE BACK SIDE OF THE EXAMINATION QUESTION PAGE.

9. Print your name in the upper right-hand corner of the first page of answer sheets whether you use the examination question pages or separate sheets of paper. Initial each of the following answer pages.

10. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.

11. If you are using separate sheets, number each answer and skip at least 3 lines between answers to allow space for grading.

12. Write "Last Page" on the last answer sheet.

13. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.

14. The point value for each question is indicated in parentheses after the question. The amount of blank space on an examination question page is NOT an indication of the depth of answer required.

15. Show all calculations, methods, or assumptions used to obtain an answer.

16. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK. NOTE: partial credit will NOT be given on multiple choice questions.

17. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.

18. If the intent of a question is unclear, ask questions of the examiner only.

19. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.

20. To pass the examination, you must achieve an overall grade of 80% or greater.

21. There is a time limit of (4 1/2) hours for completion of the examination. (or some other time if less than the full examination is taken.)

22. When you are done and have turned in your examination, leave the examination area as defined by the examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION: 001 (1.00)

In accordance with administrative procedures, which of the following evolutions may be performed without the applicable procedure present?

1. An ABO is going to charge Penetration Room canisters.
2. A CRO is going to add DI water to the quench tank.
3. A CRO is going to roll the Unit 1 main turbine.

a. 1. and 2. only
b. 2. and 3. only
c. 1. and 3. only
d. 1., 2. and 3.

QUESTION: 002 (1.00)

Units 1 and 2 are operating at rated power with minimum shift staffing per CCI-140F (Shift Staffing). A loss of offsite power causes both units to trip. The Control Room Supervisor (CRS) begins implementing EOP-0 (Post-Trip Immediate Actions) for Unit 1. Which one of the following individuals is responsible for implementing EOP-0 as the CRS for Unit 2?

a. Shift Supervisors Assistant

b. Plant Watch Supervisor

c. Shift Supervisor

d. Control Room Supervisor

QUESTION: 003 (1.00)

To verify the position of a FULLY OPEN manually-operated valve, the operator should:

a. fully close the valve, then reopen the valve to the fully open position.

b. operate the valve handwheel in the open direction; if the handwheel does not move, the valve is fully open.

c. operate the valve handwheel in the open direction until the valve is backseated one-half turn.

d. operate the valve handwheel in the close direction, then reopen the valve to the fully open position.

QUESTION: 004 (1.00)

In accordance with administrative procedures, for which one of the following reasons may the CRO leave the control room routine surveillance area without first being relieved?

a. Verify receipt of alarms and initiate corrective actions.

b. Complete control room logs and hang safety tags.

c. Conduct shiftly control room tour and communicate with CRS or SS.

d. Obtain controlled keys and review shift supervisor's log.

QUESTION: 005 (1.00)

A 23 year-old male licensed operator has the following exposure history:

Lifetime whole body dose (including current quarter) - 24.6 rem
Current quarterly whole body dose - 600 mrem

Assuming his exposure is properly documented, what is the maximum ADDITIONAL whole body exposure this operator can receive this quarter and still comply with 10 CFR 20?

a. 400 mrem

b. 625 mrem

c. 2400 mrem

d. 2625 mrem

QUESTION: 006 (1.00)

A licensed operator working in a controlled area has been issued a 0 - 200 mrem self-reading dosimeter. Assuming his quarterly whole body exposure limits are not exceeded, the operator must immediately notify Rad-Con Operations when his dosimeter first indicates:

a. > 50 mrem

b. > 100 mrem

c. > 150 mrem

d. > 200 mrem

QUESTION: 007 (1.00)

Unit 2 is increasing power from 70 percent to 100 percent. What indication should be used as the PRIMARY indication of reactor power during the power change?

a. Wide range logarithmic power channels

b. Power range Safety channels

c. RPS delta-T power channels

d. Secondary calorimetric power (plant computer)

QUESTION: 008 (1.00)

A reactor trip and safety injection has occurred on Unit 2. While monitoring SPDS, the STA notes that the CORE & RCS HEAT REMOVAL safety function block is yellow, but there is a small magenta block next to the yellow safety function block. What condition is indicated by the small magenta block?

a. Safety function status is inaccurate due to missing data.

b. Safety function status is being assessed with reduced logic.

c. Safety function is being assessed with invalid data.

d. Safety function status is yellow due to invalid data.

QUESTION: 009 (1.00)

Which one of the following combinations states the dose rate limits (in REM per hour) above which the associated area must be posted as an Exclusion High Radiation Area or a Locked High Radiation Area?

	Exclusion High Radiation Area	Locked High Radiation Area
a.	> 1	> 10
b.	> 10	> 1
c.	> 10	> 100
d.	> 100	> 10

QUESTION: 010 (1.00)

A supplementary clearance is used to:

a. expand the main clearance if the boundaries are found to be inadequate.

b amend the main clearance to include additional work which can be performed within the existing boundaries.

c. modify the main clearance to allow partial restoration of the system.

d. transfer responsibility for a main clearance between different lead persons.

QUESTION: 011 (1.00)

Which one of the following types of work does NOT require a tagging clearance:

a. Troubleshooting an electrical circuit

b. Changing the oil on an air compressor

c. Removal/Reinstallation of fuses for an RMS functional test

d. Local leak rate testing of a containment penetration

QUESTION: 012 (1.00)

For the purposes of safety tagging, a high energy system is defined as:

a. A system containing liquids or gases at greater than 500 psig OR greater than 200 degrees F.

b. A system that operates at greater than 600 volts OR greater than 30 amps.

c. A system containing liquids or gases at greater than 500 psig AND greater than 200 degrees F.

d. A system that operates at greater than 600 volts AND greater than 30 amps.

QUESTION: 013 (1.00)

The past quarterly surveillance intervals on the pressurizer PORV block valves (STP-0-65-1) are as follows:

1. Completed satisfactorily today
2. Completed satisfactorily 89 days ago
3. Completed satisfactorily 189 days ago
4. Completed satisfactorily 303 days ago

During the above time period, how many days were the PORV block valves inoperable due to improper surveillance interval(s)?

a. 0

b. 4

c. 10.5

d. 30

QUESTION: 014 (1.00)

Upon the occurrence of a plant transient, which one of the following is the most appropriate response of the on-shift SS?

a. Ensure that all required data is recorded in the transient log.

b. Personally record all required data in the transient log.

c. Ensure that someone collects all required data so that he (the SS) may record it in the transient log.

d. Personally collect and record all required data in the transient log.

QUESTION: 015 (1.00)

"Verbatim compliance", per CCI-300:

a. allows the CRO to use his judgement in determining how to implement a procedure.

b. requires the CRO to use approved procedures step-by-step, word-for-word.

c. allows the SS to make on-the-spot changes to approved procedures for convenience of operating.

d. is unnecessary for day-to-day operations if the operator uses journeyman knowledge.

QUESTION: 016 (1.00)

Choose the event below for which GREATER than one hour is allowed for notification of the NRC.

a. Loss of containment integrity during power operation

b. Violation of a safety limit

c. Fuel cladding failures found during refueling operations

d. Declaration of an unusual event

QUESTION: 017 (1.50)

Unit 1 is operating at full power and Unit 2 is conducting refueling when a station blackout occurs. 12 CST level gradually decreases to 5 feet. List the THREE (3) alternate water sources available to provide suction to the Unit 1 AFW pumps in order of priority. Assume DI water is not available. (Answer on lines below.) (0.5 each)

1. (1st priority) _____

2. (2nd priority) _____

3. (3rd priority) _____

QUESTION: 018 (1.00)

Unit 1 is operating at rated power when a shutdown group CEA drops into the core (fully inserted). Assuming the reactor does not trip, what color status light(s) will be illuminated for the dropped CEA on the CEA mimic display?

a. Amber only

b. Amber and green only

c. Amber, green, and blue only

d. Amber, green, blue, and red

QUESTION: 019 (1.00)

Unit 2 is operating at 50 percent power during a load increase with 21 SGFP operating in automatic and 22 SGFP running in standby. The 21 SGFP trips, resulting in a low S/G level reactor trip and turbine trip. Why does AOP-3G (Malfunctions of MFW System) require the operator to feed the S/Gs using the AFW system instead of using 22 SGFP?

a. To minimize the possibility of overfilling the S/Gs.

b. To minimize the possibility of water hammer in the main feedwater system.

c. To minimize the possibility of thermal shock to the S/G feed ring J-tubes.

d. To ensure the most reliable source of feedwater is used to restore S/G level.

QUESTION: 020 (1.00)

Alternate action 2.3 of EOP-0 (Post-Trip Immediate Actions) requires the operator to verify SIAS actuation if RCS pressure decreases to 1725 psia. What is/are the minimum indication(s)/equipment actuation(s) that must be checked to verify SIAS actuation during implementation of EOP-0.

a. "ACTUATION SYS SIAS TRIPPED" annunciator

b. "ACTUATION SYS SIAS TRIPPED" annunciator, and HPSI pumps started

c. "ACTUATION SYS SIAS TRIPPED" annunciator, HPSI pumps started, and LPSI pumps started

d. "ACTUATION SYS SIAS TRIPPED" annunciator, and SI cold leg discharge valves open

QUESTION: 021 (1.00)

Upon determining that a control room evacuation is required (because of a control room fire) per AOP-9A (Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire), which one of the following operators is responsible for tripping the Unit 1 main turbine at the front standard.

a. Unit 1 RO

b. Unit 1 CRO

c. Unit 2 RO

d. Unit 2 CRO

QUESTION: 022 (1.00)

Unit 1 has experienced a main steam line rupture. Both S/Gs have been isolated per EOP-4 (Excess Steam Demand). The following conditions currently exist:

S/G A level - 100 inches and stable
S/G B level - 50 inches and stable
S/G A pressure - 800 psia and decreasing slowly
S/G B pressure - 680 psia and increasing slowly
S/G A steam flow - 0 lbm/hr
S/G B steam flow - 0 lbm/hr
RCS pressure - 1600 psig and increasing slowly
Loop 1 T-cold - 520 degrees F and decreasing slowly
Loop 2 T-cold - 500 degrees F and increasing slowly
1 RCP running in each loop

Which of the following describes current plant status.

a. S/G A is the affected S/G, the break is inside containment.

b. S/G B is the affected S/G, the break is outside containment.

c. S/G A is the affected S/G, the break is outside containment.

d. S/G B is the affected S/G, the break is inside containment.

QUESTION: 023 (1.00)

Unit 2 has experienced a loss of offsite power and is starting a cooldown on natural circulation. An atmospheric steam dump valve has just been opened to start the RCS cooldown. Which one of the following indications will provide the operators with the quickest RCS feedback from the atmospheric dump valve operation on the RCS?

a. RCS loop T-hot

b. RCS loop T-cold

c. Pressurizer level

d. S/G level

QUESTION: 024 (1.00)

Unit 1 has experienced a total loss of all feedwater and is currently implementing once-through core cooling per EOP-3 (Total Loss of All Feedwater). A RAS has occurred and the HPSI pumps are taking suction from the containment sump. Why must total HPSI flow be limited to 1000 gpm when two HPSI pumps are running under these conditions?

a. To minimize the amount of coolant flowing to the quench tank via the PORVs.

b. To minimize the possibility of HPSI pump runout.

c. To minimize the possibility of HPSI pump cavitation.

d. To minimize the rate of level decrease in the containment sump.

QUESTION: 025 (1.00)

The plant has been operating at rated power for more than two weeks. While reviewing his panels, the reactor operator notes that since his last review, the megawatt output meter has decreased by about 25 MW, while reactor power, T-ref, and T-avg have remained constant. Which one of the following is the most likely cause of this unnoticed output power/reactor power mismatch?

a. A large load reduction on the grid.

b. A feed excursion causing increased SG levels.

c. A leaking SG code safety valve.

d. An air leak in the main condenser.

QUESTION: 026 (1.00)

During refueling of Unit 2, with a spent fuel assembly raised to the hoist-up limit (above the reactor vessel flange), the maximum credible failure of the refueling pool seal occurs. Select the approximate time required for the radiation dose rate at the Fuel Handling Machine Platform to reach 1R/hr with no operator action. Assume the Transfer Tube Gate valve is open.

a. 3 minutes

b. 30 minutes

c. 3 hours

d. 30 hours

QUESTION: 027 (1.00)

If the saltwater valve handswitches are NOT manipulated during a large-break loss of coolant accident, which one of the following describes the saltwater flow conditions through the COMPONENT COOLING heat exchangers during the accident?

a. Full flow during SI injection phase; throttled flow during recirculation phase

b. No flow during SI injection phase; throttled flow during recirculation phase

c. Full flow during SI injection phase; full flow during recirculation phase

d. No flow during SI injection phase; full flow during recirculation phase

QUESTION: 028 (1.00)

After RAS has occurred on a LOCA, FOP-5 (Loss of Coolant Accident) directs the operator to throttle HPSI flow if HPSI pump cavitation is occurring. If throttling is not successful, the Alternate Action is to align containment spray to the HPSI pump suction. Which one of the following is the purpose of this Alternate Action?

a. To increase the heat removal capacity of the HPSI water going to the core.

b. To increase the system pressure at the suction of the HPSI pump.

c. To match the core cooldown rate to the containment building depressurization rate.

d. To match the injection rate to the containment sump drawdown rate.

QUESTION: 029 (3.00)

Unit 2 has experienced a steamline rupture and is currently implementing EOP-4 (Excess Steam Demand). In addition to the MSIVs and MSIV bypass valves, list SIX (6) other sets of valves that must be shut to isolate the S/Gs. (0.50 each)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

QUESTION: 030 (2.00)

For each of the components in column A, select the proper component response from column B for a total loss of instrument air (IA) pressure. Assume each component was in operation when IA was lost. (Items in column B may be used once, more than once, or not at all. However, each blank in column A has only one answer.) (0.50 each)

Column A (COMPONENTS)	Column B (RESPONSE)
_____ a. Letdown pressure control valve	1. fails open/maximum flow
_____ b. Atmospheric dump valves	2. fails closed/no flow
_____ c. EDG service water supply valves	3. fails as is/ no change in flow
_____ d. Turbine AFW pump speed governor	4. no immediate effect/ system operates normally

QUESTION: 031 (1.00)

Select the basis for tripping all reactor coolant pumps after a total loss of all feedwater occurs.

a. Prevents RCP cavitation when the RCS reaches saturation conditions.

b. Prevents RCP seal damage when CIS actuates.

c. Reduces heat input to the RCS.

d. Reduces RCP motor damage from steam when once-through core cooling is initiated.

QUESTION: 032 (1.00)

A S/G tube rupture has occurred on Unit 1 and all RCPs have been stopped. Which one of the following is the reason for maintaining RCS subcooling between 25 degrees F and 35 degrees F during plant cooldown and depressurization on natural circulation?

a. This amount of subcooling will help to maintain pressurizer level above the heater cutout setpoint.

b. This amount of subcooling ensures sufficient NPSH for subsequent RCP start.

c. This amount of subcooling reduces the RCS leak rate into the S/G and prevents the possible lifting of a S/G safety valve.

d. This amount of subcooling prevents drawing a bubble in the reactor vessel head during depressurization.

QUESTION: 033 (1.00)

Which one of the following describes why EOP-4 (Excess Steam Demand) allows throttling HPSI flow to maintain a lower pressurizer level during the S/G blowdown phase than after the blowdown phase is completed?

a. To minimize the possibility of pressurizer overfill due to RCS heatup after blowdown is complete.

b. To ensure the pressurizer heaters stay de-energized, thus minimizing the possibility of pressurized thermal shock.

c. To ensure letdown flow remains at a minimum, thus reducing the mass loss from the RCS.

d. To minimize the amount of cold ECCS water that has to be charged into the RCS so that the excessive cooldown rate is not aggravated.

QUESTION: 034 (1.00)

Unit 1 is operating at rated power with all CEAs fully withdrawn and all systems operating normally. A regulating CEA drops to the bottom of the core but the reactor does not trip. In response to these conditions the operator should:

a. Adjust boron concentration to maintain T-cold.

b. Adjust turbine load as necessary to maintain T-cold.

c. Use regulating CEAs as necessary to maintain T-cold.

d. Manually trip the reactor.

QUESTION: 035 (1.00)

A reactor trip and turbine trip have occurred from rated power; no ESFAS actuations have occurred. The following conditions currently exist:

Reactor power: 1% and decreasing
All CEAs fully inserted
Pressurizer level: 50 inches and decreasing
Pressurizer pressure: 1715 psia and decreasing
S/G pressures: 785 psia and decreasing
RCS T-cold: 520 degrees F and decreasing
S/G levels: -150 inches and decreasing
Containment pressure: 0.8 psig and steady

Which of the following states the required operator actions for these conditions?

a. Verify safety injection, CIS, and trip all RCPs.

b. Verify safety injection, SGIS, and AFAS.

c. Block safety injection, throttle AFW flow and shut the MSIVs.

d. Verify safety injection, trip 2 RCPs, and shut the MSIVs.

QUESTION: 036 (1.00)

Following a reactor trip, an SPDS alarm is received on 2C03. The REACTIVITY block is yellow. The CEA mimic display reveals that all the CEAs are green with the exception of CEA 46, which indicates only red. This is an indication that CEA 46 is:

a. Still fully withdrawn.

b. Ejected from the core.

c. Not fully inserted.

d. At the Lower Electrical Limit.

QUESTION: 037 (1.00)

If a steam generator tube rupture occurs, the operator is not allowed to isolate the affected steam generator until RCS T-hot is less than 515 degrees F. Select the basis for this criterion.

a. Ensures subcooling margin is not lost when the ruptured S/G is isolated.

b. Ensures the ruptured S/G safety valve(s) will not lift after the ruptured S/G is isolated.

c. Prevents exceeding RCP trip criteria after the ruptured S/G is isolated.

d. Minimizes the RCS leak rate into the ruptured S/G before it is isolated.

QUESTION: 039 (1.00)

Unit 1 is operating at rated power with one charging pump running. Which one of the following provides positive indication that a charging pump header leak has occurred?

a. Decreasing pressurizer level with minimum letdown flow.

b. Charging header pressure greater than RCS pressure.

c. Charging header flow indication less than 44 gpm.

d. Charging header pressure less than RCS pressure.

QUESTION: 038 (1.00)

A reactor trip has occurred and the immediate actions of EOP-0 have been performed. The following plant conditions exist:

Pressurizer level is decreasing rapidly
RCS pressure is decreasing rapidly
S/G pressures are 900 psia and stable
Containment pressure is 0 psig and stable
Containment radiation levels are normal
Pressurizer safety/PORV tailpipe temperatures are 105 degrees F

Which one of the following events is in progress?

a. Loss of coolant outside containment.

b. Steam break outside containment.

c. Steam generator tube rupture.

d. Feed line break inside containment.

QUESTION: 040 (1.00)

Unit 2 is operating at rated power when a tube rupture occurs in 21 S/G. Which one of the foliowing pretrip comparisons between the two S/Gs would be LEAST helpful in determining which S/G has the ruptured tube?

a. Comparison of S/G feedwater regulating valve positions

b. Comparison of S/G water levels

c. Comparison of S/G chemistry samples

d. Comparison of S/G steam flow rates

QUESTION: 041 (1.00)

A reactor trip and SIAS have occurred on Unit 1 because of a small-break LOCA. Which one of the following criteria does NOT satisfy HPSI termination criteria.

a. RCS subcooling at 40 degrees F and increasing.

b. Pressurizer level at 90 inches and increasing.

c. Only one S/G available for heat removal.

d. RVLMS indicates that the core is fully covered.

(TION: 042 (1.00)

station blackout has occurred. Select the condition below which is a direct indication of a void in the S/G tubes during natural circulation.

a. S/G pressure greater than RCS pressure.

b. Rapid increase in pressurizer level during a RCS pressure reduction.

c. Loss of RCS subcooled margin.

d. "REACTOR VESSEL WATER LEVEL LOW" alarm.

QUESTION: 043 (1.00)

Unit 1 is in Mode 6. Fuel movement is NOT in progress. Shutdown cooling is in operation with 12 LPSI pump running. Annunciator M-04 ("4KV ENG SF MOTOR OVERLOAD") is activated. During investigation, the Reactor Operator finds that 12 LPSI pump is not running. The NEXT operator action should be to:

a. restart 12 LPSI pump.

b. start 11 LPSI pump.

c. start 11 or 12 containment spray pump.

d. determine why 12 LPSI pump has stopped.

QUESTION: 044 (1.00)

After an extended loss of forced circulation in the RCS, one of the RCP restart criteria is T-cold less than 525 degrees F. The basis for this criterion is to ensure that:

a. the lower RCP seal temperature will be below 280 degrees F.

b. RCS subcooling is > 30 degrees F prior to RCP start.

c. there is adequate NPSH for the reactor coolant pump to operate.

d. S/G pressure will remain below the safety valve setpoint if a temperature transient occurs during RCP start.

QUESTION: 045 (2.00)

Unit 1 is operating at rated power. Match each of the following RCP seal pressure (psia) conditions in column A to the appropriate seal status in column B. (Column B items may be used once, more than once, or not at all. However, each blank in column A has only one answer.) (0.5 each)

Column A
(RCP SEAL CONDITIONS)

	RCS	MIDDLE SEAL	UPPER SEAL	VCT
_____ a.	2250	1050	1050	50
_____ b.	2250	1400	700	40
_____ c.	2250	1100	50	48
_____ d.	2250	2250	1100	45

Column B
(SEAL STATUS)

1. Normal
2. Lower Seal Failure
3. Middle Seal Failure
4. Upper Seal Failure
5. Lower and Middle Seal Failure
6. Middle and Upper Seal Failure

QUESTION: 046 (1.00)

A Unit 2 reactor trip has occurred. EOP-0 (Post-Trip Immediate Actions) is in progress. The Turbine Trip button has been depressed, but the 21 generator bus breaker (552-61) has remained closed and the turbine stop valves are still open. Which one of the following actions should be performed immediately per EOP-0?

a. Locally trip the turbine.

b. Open 21 generator bus breaker, 552-61.

c. Stop EHC pump(s).

d. Shut both MSIVs.

QUESTION: 047 (1.00)

A loss of instrument air (IA) pressure has resulted in the automatic closing of containment instrument air valve, CV-2085. How can CV-2085 be reopened after IA pressure has been restored?

a. Place HS-2085 in CLOSE to reset the logic circuitry, then place HS-2085 in OPEN and release. CV-2085 will immediately open and remain open regardless of containment IA pressure.

b. Place HS-2085 in CLOSE for six seconds to reset the logic circuitry, then place HS-2085 in OPEN and release; CV-2085 will immediately open and remain open regardless of containment IA pressure.

c. Place HS-2085 in OPEN and hold for six seconds, then release; CV-2085 will immediately open. If containment IA pressure is not restored, CV-2085 will reclose when the switch is released.

d. Place HS-2085 in OPEN and release; CV-2085 will immediately open. If containment IA pressure is not restored with six seconds, CV-2085 will reclose.

QUESTION: 048 (1.00)

The control room has been evacuated because of a fire in 1C02. Why is it necessary to remove the CLOSE fuses for a RCP breaker prior to locally opening the breaker?

a. To ensure the charging spring discharges.

b. To maintain the operability of the breaker "customer" trips.

c. To prevent breaker closing on a fault.

d. To ensure the breaker opens on interlock.

QUESTION: 049 (1.00)

While in Mode 3, identified leakage on Unit 1 increases to 9.4 gpm. Assuming that none of this leakage is due to S/G tube leaks, what ADDITIONAL primary-to-secondary leakage through the steam generators is allowed before Technical Specification action is required?

a. none

b. 0.6 gpm

c. 1.0 gpm

d. 1.6 gpm

QUESTION: 050 (1.00)

Unit 2 is operating at rated power when a valid "11/12 SERV WATER HEADER PRESS LO" alarm is received. AOP-7B (Loss of Service Water) is implemented. AOP-7B directs the operator to reduce heat load on the service water system by reducing main generator MVARs to zero. How does reducing MVARs reduce the heat load on service water?

a. Generator current is reduced which reduces generator heat generation.

b. Generator terminal voltage is reduced which reduces real load.

c. Hydrogen pressure increases which improves heat transfer.

d. Rotor windage heat generation is reduced.

QUESTION: 051 (1.00)

A liquid waste discharge of 12 RCW Monitor Tank is being performed using the RCW Monitor Tank Metering Pump. Which one of the following describes all the automatic actions that will occur if, during the discharge, a high alarm is received on the liquid effluent radwaste monitor, RM-2201?

a. Liquid Waste Control Valve, MWS-2201-CV, will close.

b. Liquid Waste Control Valves MWS-2201-CV and MWS-2202-CV will close.

c. Liquid Waste Control Valve, MWS-2201-CV, will close and the RCW Monitor Tank Metering Pump will stop.

d. Liquid Waste Control Valves, MWS-2201-CV and MWS-2202-CV, will close and the RCW Monitor Tank Metering Pump will stop.

QUESTION: 052 (1.00)

Unit 1 has increased power from 50 percent to 100 percent over a two-hour period. During followup sampling of the RCS, it is observed that dose equivalent I-135 has increased from 0.25 microcuries/gram to 1.45 microcuries/gram. Assuming no fuel damage occurred during the power increase, which one of the following is the most likely cause of the increased RCS activity?

a. The increased RCS temperature caused a release of corrosion products which contain I-135.

b. The increased fuel temperature caused fission products, which contain I-131, to be expelled through existing fuel defects into the RCS.

c. The increased radiation level in the core caused increased activation of the moderator and surrounding materials, resulting in greater I-131 production.

d. The increased fuel temperature caused fuel pellets to come in direct contact with the fuel clad, allowing migration of Xe-135 through the clad into the RCS where it decays into I-135.

QUESTION: 053 (1.00)

Unit 1 is operating at rated power when a reactor trip occurs. An operator observes that two CEAs failed to insert and begins borating per EOP-0 (Post-Trip Immediate Actions). Which one of the following is NOT required by EOP-0 to initiate a boration?

a. Open Boric Acid Direct Makeup Valve, 1-CVC-514-MOV.

b. Close VCT Outlet Isolation Valve, 1-CVC-501-MOV.

c. Start a boric acid pump.

d. Start all available charging pumps.

QUESTION: 054 (1.00)

Which one of the following describes the effect of placing the hand transfer valves for the AFW flow control valves in Position 2.

a. The valves will fail closed.

b. The valves will fail open.

c. Control air for the valves is aligned to the 1C43 controllers.

d. Control air for the valves is aligned to the control room controllers.

QUESTION: 055 (1.00)

Unit 2 has been operating at rated power for four weeks. Which one of the following will occur if a slow continuous rod withdrawal occurs? Assume no operator actions and the reactor does not trip.

a. T-cold increases, T-avg exceeds T-ref, pressurizer level increases

b. T-cold decreases, T-ref exceeds T-avg, pressurizer level increases

c. T-cold increases, T-avg exceeds T-ref, pressurizer level decreases

d. T-cold decreases, T-ref exceeds T-avg, pressurizer level decreases

QUESTION: 056 (1.00)

Why is trisodium phosphate dodecahydrate (TSP) dissolved in containment sump water during a LOCA?

a. Minimize the possibility of corrosion cracking of metal components during operation of ECCS.

b. Minimize the possibility of cavitation at the suction of the ECCS pumps.

c. Minimize the amount of hydrogen generated by radiation-induced decomposition of the containment sump water.

d. Minimize the amount of boric acid required to be added to the RWT.

QUESTION: 057 (1.00)

Refer to figure 1. (Attached)

With the 12 S/G level transmitter isolation switch in the center/normal position, single-element feedwater control receives input from _____ and three-element feedwater control receives input from _____.

a. LT-1106; LT-1106

b. LT-1121; LT-1121

c. LT-1106; LT-1121

d. LT-1121; LT-1106

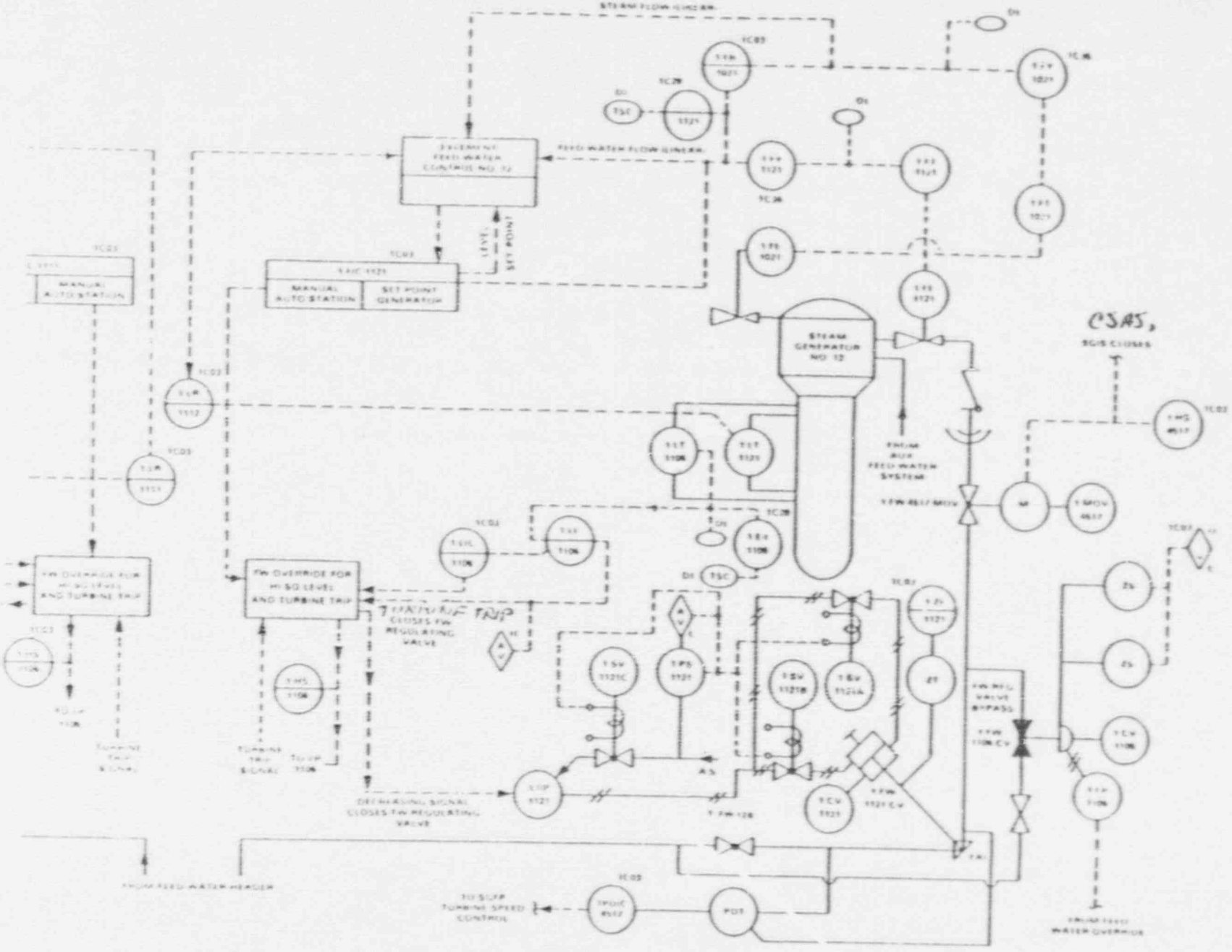

STEAM FLOW (LINEAR)
FEED WATER FLOW (LINEAR)
LEVEL SET POINT
MANUAL AUTO STATION
MANUAL AUTO STATION
SET POINT GENERATION
STEAM GENERATOR NO. 12
FROM AUX FEED WATER SYSTEM
FW OVERRIDE FOR HI SG LEVEL AND TURBINE TRIP
FW OVERRIDE FOR HI SG LEVEL AND TURBINE TRIP
TURBINE TRIP CLOSES FW REGULATING VALVE
DECREASING SIGNAL CLOSES FW REGULATING VALVE
FW REG VALVE BYPASS
TO STM TURBINE SPEED CONTROL
FROM FEED WATER HEADER
FROM FEED WATER OVERRIDE
CSAS,

FIGURE 1

QUESTION: 058 (1.00)

Refer to attachment 11.

Units 1 and 2 have suffered a loss of offsite power. The levels in the condensate storage tanks are as follows:

11 CST - 19 feet
12 CST - 32.5 feet
21 CST - 5.3 feet

How much time is left until cooldown is required to be commenced on both units?

a. 1.5 hours

b. 4.5 hours

c. 14.5 hours

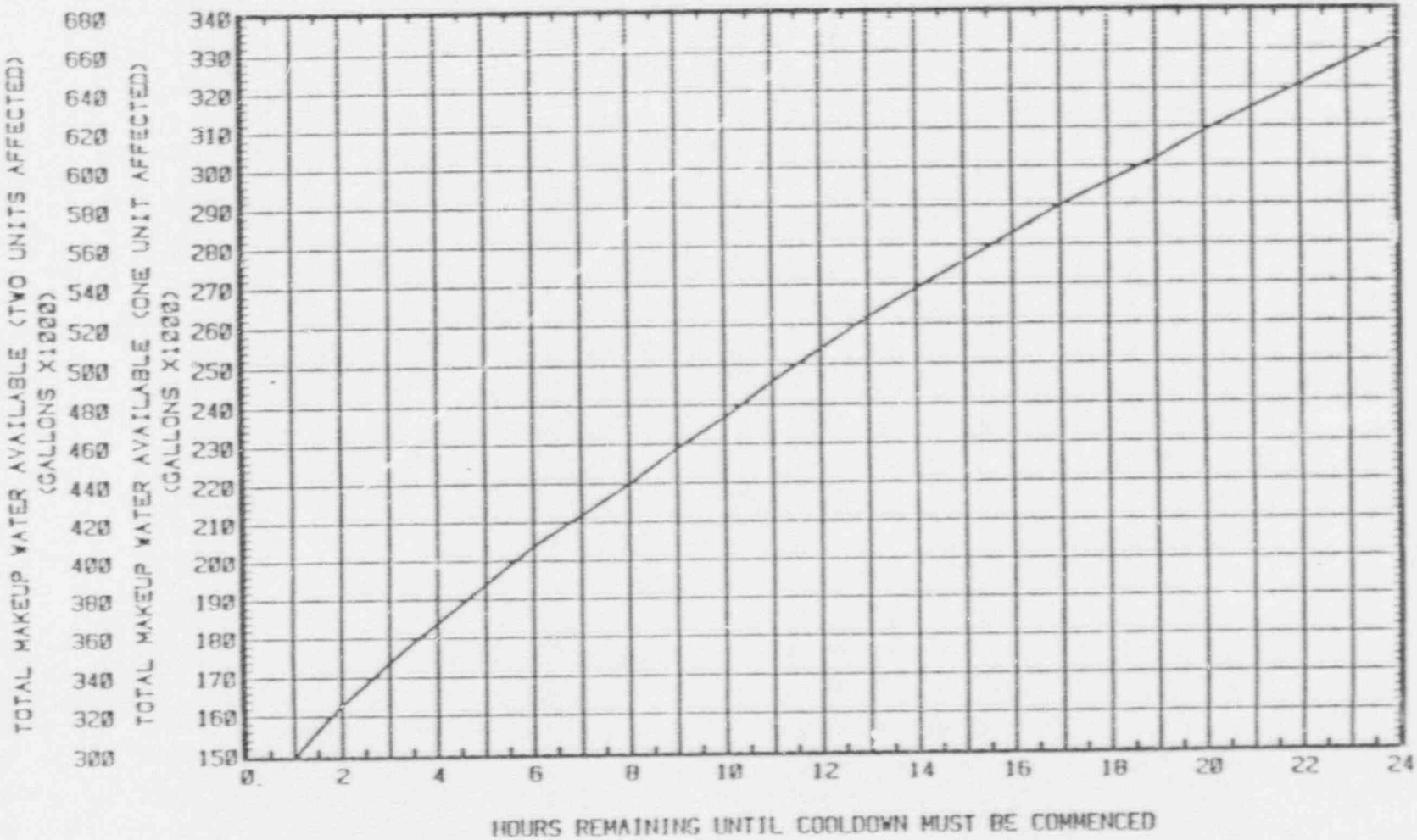
d. 20.5 hours

COOM CR
88-1137

MAKEUP WATER REQUIRED FOR RCS COOLDOWN

MAKEUP REQUIRED VS. TIME UNTIL RCS COOLDOWN IS COMMENCED

(1 FT. = 9636.78 GAL.)



QUESTION: 059 (1.00)

Unit 2 is operating at rated power when a switchyard fault occurs resulting in a loss of offsite power and a reactor trip. EOP-0 has been completed but natural circulation has not been verified yet. Which one of the following conditions would indicate that natural circulation flow has NOT been established?

a. Pressurizer level at 110 inches and decreasing

b. Steam generator pressures at 920 psig and increasing slowly

c. RCS subcooling at 18 degrees F and increasing slowly

d. Core differential temperature at 22 degrees F and decreasing slowly

QUESTION: 060 (1.00)

Whenever (11) or (12) 120 vac vital bus is powered by its backup bus, the associated EDG must be declared inoperable. Choose the reason for this declaration.

a. Vital diesel auxiliaries are de-energized when the 120 vac vital bus is on backup.

b. Associated logic channels will not function to automatically start the diesel on a loss of power.

c. Associated logic channels will not function to automatically start the diesel on a SIAS.

d. For a loss of offsite power with a loss of coolant, the diesel will start but the LOCI sequencer will be de-energized.

QUESTION: 061 (1.00)

Unit 1 is operating at rated power and the Diverse Scram System performance evaluation is due. Which one of the following describes the effect of shutting the CEDM MG set bypass load contactors?

a. Shutting either CEDM MG set bypass load contactor will render the Diverse Scram System inoperable.

b. The Diverse Scram System will be inoperable only if both CEDM MG bypass load contactors are shut.

c. The Diverse Scram System is unaffected by the position of either CEDM MG bypass load contactor.

d. When the second CEDM MG set bypass load contactor is shut the "DSS LOAD CONTACTOR BYPASS" annunciator will alarm on 1C05.

QUESTION: 062 (1.00)

Unit 2 had been operating at rated power for one month when a reactor trip occurred. An ECC calculation was performed for a reactor startup with criticality estimated at 24 hours after the trip. Complications delayed restart another 12 hours and a second ECC calculation was performed. The desired critical CEA position was kept the same for both ECCs. Which one of the following statements describes the relationship between the two ECC calculations?

a. The second ECC requires a lower critical boron concentration due to the change in xenon reactivity.

b. The second ECC requires a higher critical boron concentration due to the change in xenon reactivity.

c. The second ECC requires a lower critical boron concentration due to the change in decay heat level.

d. The second ECC requires a higher critical boron concentration due to the change in decay heat level.

QUESTION: 063 (1.00)

A rupture in the SRW return line from 12 containment cooler will:

a. cause both SRW headers to drain because the Turbine Building return lines are normally cross-connected.

b. affect only the 12 SRW header because of the Auxiliary Building return line check valves.

c. cause both SRW headers to drain because the Turbine Building supply and return lines are normally cross connected.

d. affect only the 12 SRW header because of the Turbine Building return line check valves.

QUESTION: 064 (1.00)

Refer to page 23 of NEOP-11. (Attached)

Choose the value below which is closest to the value of azimuthal power tilt for the upper detectors of the power range NIs that read as follows:

Channel A = 99.5%
Channel B = 99.8%
Channel C = 98.2%
Channel D = 100.0%

a. 0.0044

b. 0.0058

c. 0.0066

d. 0.0073

- -

NOTE
The Azimuthal Power Tilt (Tq) can be calculated using the following formula:

$$Tq = \sqrt{\frac{[2(A-C)]^2 + [2(B-D)]^2}{(A+B+C+D)^2}}$$

Where: A, B, C, and D are the power range safety channel excore detector readings.

- -

6.2.3 CALCULATE an upper detector and a lower detector AZIMUTHAL POWER TILT (Tq) AND RECORD on the Unit Log Sheet.

6.2.4 DOCUMENT on the Unit Log Sheet that the tilts were hand calculated.

6.3 AZIMUTHAL POWER TILT (Tq) GREATER THAN 0.030 BUT LESS THAN OR EQUAL TO 0.10 (TS 3.2.4.a)

6.3.1 NOTIFY the PE-NE and AGS-NO that the indicated Tq is greater than 0.030 but less than or equal to 0.10.

6.3.2 PERFORM EITHER of the following:

*CORRECT the AZIMUTHAL POWER TILT (Tq) within two (2) hours, so that Tq is less than 0.030, OR

*DETERMINE and DOCUMENT on Attachment 11-6 within the next two (2) hours and at least once per subsequent eight (8) hours, that the Total Planar Radial Peaking Factor (F_{xy}^T) and the Total Integrated Radial Peaking Factor (F_r^T) are within the limits of TS 3.2.2.2 and 3.2.3.

QUESTION: 065 (1.00)

A dead bus transfer of the (11) 13KV bus from the SMECO Power Supply System to the BG&E grid is in progress. How long can the (11) 13KV bus remain deenergized before the lockout ("286" device for (11) 13KV bus) will trip?

a. 6 to 9 milliseconds

b. 0.6 to 0.9 seconds

c. 6 to 9 seconds

d. 60 to 90 seconds

QUESTION: 066 (1.00)

List TWO (2) readily available sources of borated makeup water to the refueling pool following a failure of the refueling pool seal. (0.5 each)

1. _____

2. _____

QUESTION: 067 (1.00)

Unit 2 is operating at rated power. Containment sump draining interval has decreased from 93 minutes to 75 minutes. Waste processing ventilation RMS readings and containment atmosphere RMS readings have been slowly increasing. What is the most probable cause of these conditions?

a. S/G tube leak

b. RCS leak into containment

c. RCS leak into auxiliary building

d. RCS leaks into auxiliary building and containment

QUESTION: 068 (1.00)

Which one of the following cases meets the requirement for overriding a valid ESFAS signal?

a. To prevent an unwanted reactor trip

b. At the discretion of the SS or CRS

c. When directed by an approved procedure

d. When the signal interferes with normal operation

QUESTION: 069 (2.00)

For each of the following conditions (a., b., and c.), LIST the ESFAS signals (from those listed below) that should have actuated. Consider each condition separately. Each condition may have for its answer none, one, or several of the following actuation signals:

SIAS
CSAS
CIS
SGIS
RAS
AFAS

a. A steam-line break has occurred in containment and:

containment pressure = 7 psig
11/12 S/G levels = -145 inches and -160 inches
PZR pressure = 1800 psia
11/12 S/G pressures = 770 and 670 psia

b. A small-break LOCA has occurred and:

containment pressure = 3 psig
11/12 S/G levels = -50 inches and -50 inches
PZR pressure = 1745 psia
11/12 S/G pressures = 900 and 900 psia

c. A feedwater problem has occurred and:

containment pressure = 1 psig
11/12 S/G levels = -180 inches and -200 inches
PZR pressure = 2200 psia
11/12 S/G pressures = 720 and 650 psia

a. _____

b. _____

c. _____

QUESTION: 070 (1.00)

A LOCA results in a reactor trip and SIAS. The pressurizer empties and pressurizer pressure stabilizes at about 1150 psia. If pressurizer level is restored to 120 inches, which pressurizer heaters will automatically reenergize?

a. All Back-up and Proportional heaters.

b. Only the Proportional heaters.

c. Only the Back-up heaters (all sets).

d. Only two sets of Back-up heaters.

QUESTION: 071 (1.00)

Which one of the following describes why the containment cooling units are designed to shift to low speed and high service water flow for a main steamline rupture inside containment.

a. Low speed reduces electrical load on D/Gs if no off-site power is available; high service water flow limits containment pressure rise.

b. Low speed reduces the possibility of damage in an adverse containment atmosphere; high service water flow keeps the motor and fan cool.

c. Low speed reduces electrical load on D/Gs if no off-site power is available; high service water flow keeps the motor and fan cool.

d. Low speed reduces the possibility of damage in an adverse containment atmosphere; high service water flow limits containment pressure rise.

QUESTION: 072 (2.00)

List FOUR (4) automatic trips that will be active for the 12 diesel generator during a SIAS. (0.50 each)

1. _____

2. _____

3. _____

4. _____

QUESTION: 073 (1.00)

Unit 1 is operating at rated power when a reactor trip occurs and two CEAs fail to insert. With a current RCS boron concentration of 600 ppm, a boration should be performed until RCS boron concentration is at least:

a. 800 ppm

b. 1000 ppm

c. 1800 ppm

d. 2300 ppm

QUESTION: 074 (1.00)

Why is it necessary to depress the Precharge button on the computer inverter before shutting the battery input breaker during inverter startup?

a. Precharging minimizes the voltage and current transients which may occur when the breaker is shut.

b. Precharging causes the charging spring motor to operate to charge the closing spring.

c. Precharging disengages the breaker tripping mechanism in the event it was left engaged.

d. Precharging allows the inverter to be declared operable prior to completion of a 30-minute warmup period.

QUESTION: 075 (1.00)

During Mode 5, with the pressurizer drained, planned dilution flow must be less than _____ gpm and RCS flow must be at least _____ gpm.

a. 44; 3000

b. 88; 3000

c. 44; 1500

d. 88; 1500

QUESTION: 076 (1.00)

Refer to attachment 12.

Which one of the following combinations of RCS pressure and HPSI header flow represent expected/allowed conditions for a single HPSI pump in service before RAS actuation during a LOCA?

a. 1000 psia and 180 gpm

b. 900 psia and 480 gpm

c. 600 psia and 600 gpm

d. 225 psia and 800 gpm

QUESTION: 077 (1.00)

Refer to attachment 1.

A LOCA has occurred on Unit 2 with current plant conditions as follows:

RCS T-cold	-	450 degrees F
RCS pressure	-	600 psia
RCS subcooling	-	36 degrees F
Containment pressure	-	5 psig

According to the RCP trip strategy, the correct RCP lineup for this event is:

a. 2 pumps in the same loop.

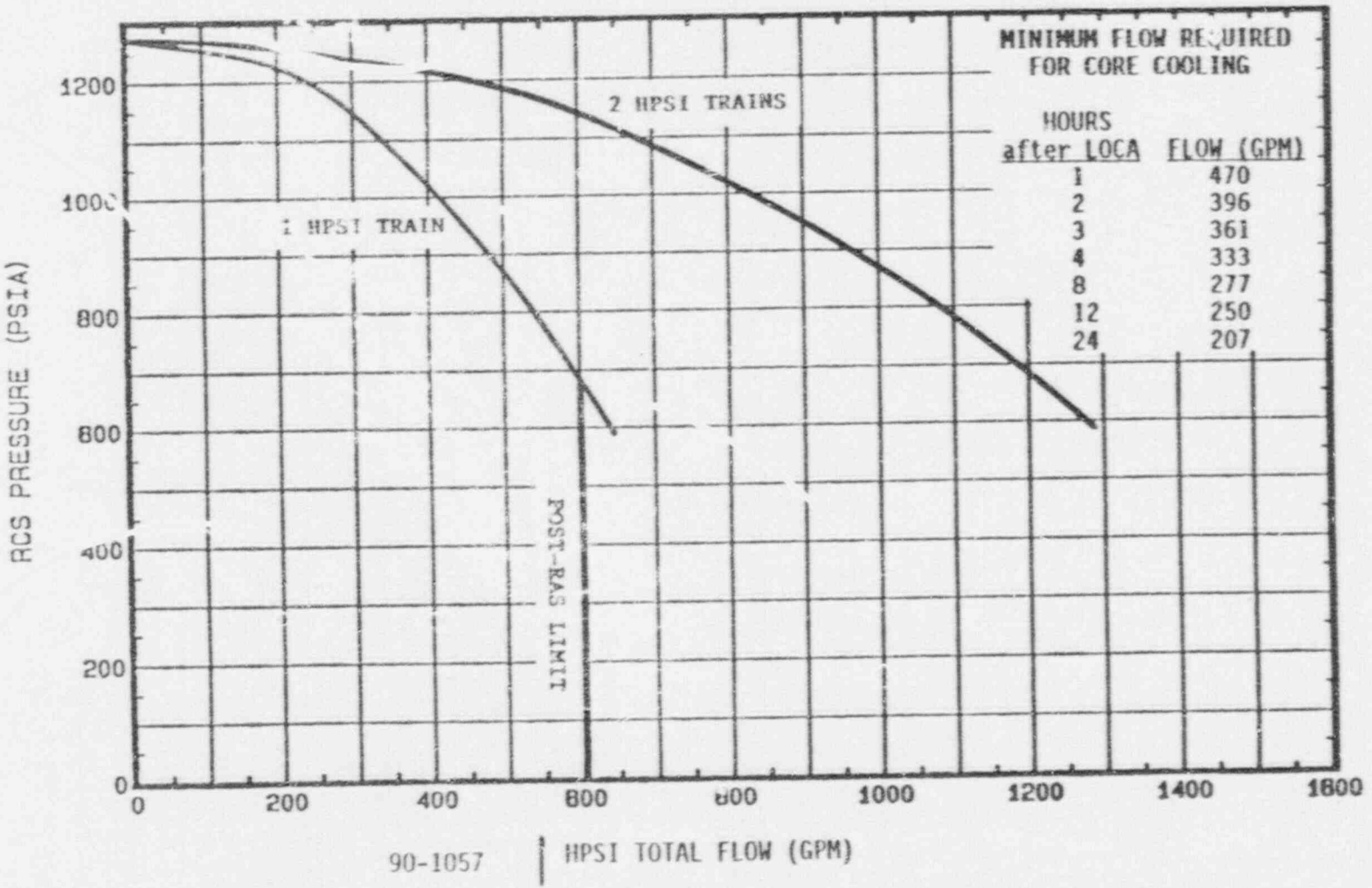
b. 2 pumps in opposite loops.

c. no pumps operating.

d. 2 pumps in the pressurizer loop.

HIGH PRESSURE SAFETY INJECTION FLOW

RCS PRESSURE VS. FLOW



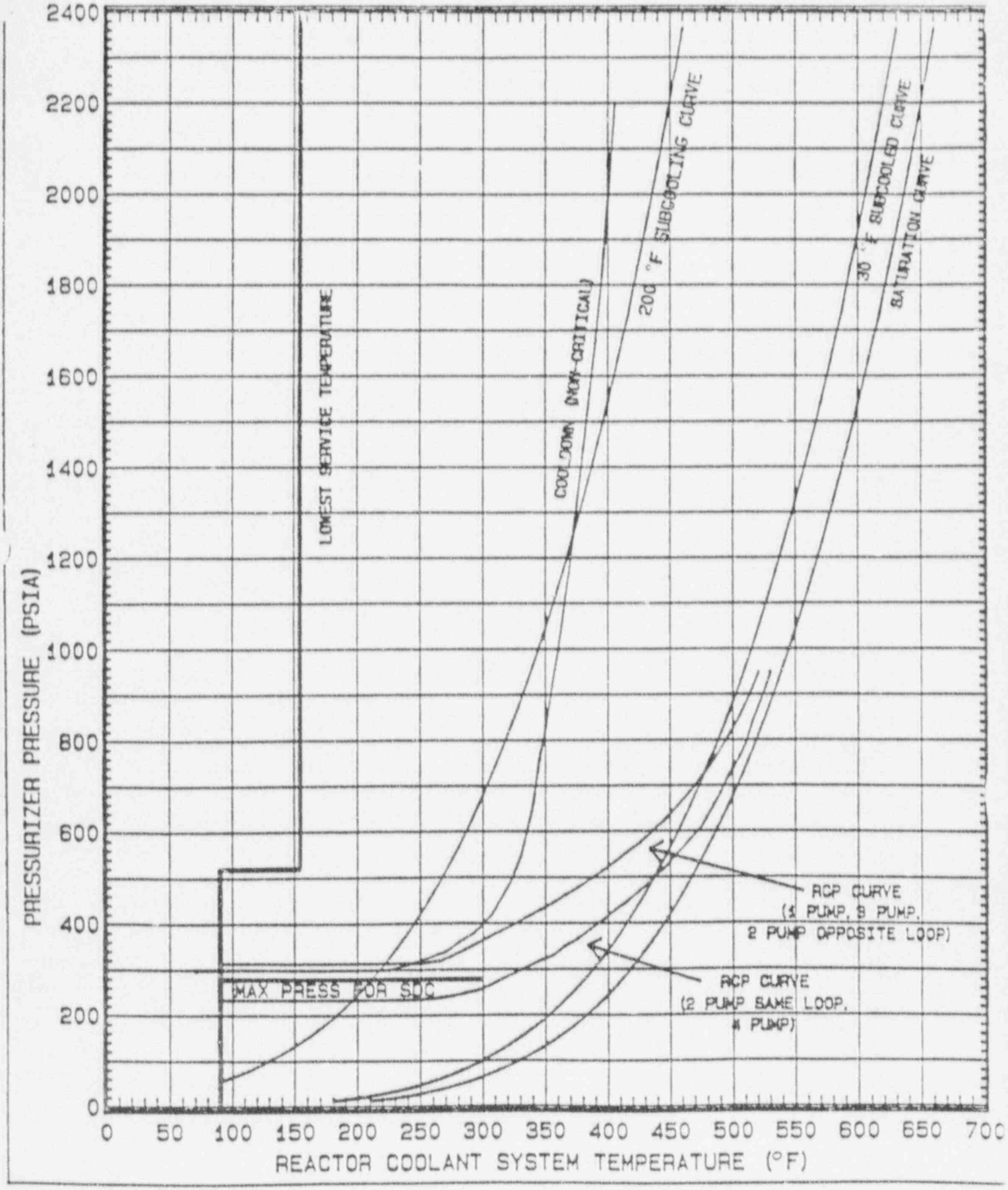
90-1057

ATTACHMENT (12)

ATTACHMENTS
REV. 1 /UNIT 1
PAGE 1 OF 1

RCS PRESSURE TEMPERATURE LIMITS

10-40 YEAR CURVE



QUESTION: 078 (1.00)

The Salt Water Air Compressors (SWACs) are used instead of the Instrument Air (IA) Compressors in the event of a severe control room fire because:

a. the SWACs do not require an external cooling source.

b. cooling water is available to the SWACs but not the IA compressors.

c. the ADVs are supplied by Salt Water Air.

d. the IA compressors may not start because of the Control Room fault.

QUESTION: 0/13 (1.00)

The normal lineup for #13 SRW pump, electrically and mechanically, is:

a. 14 4KV bus and 12 SRW header

b. 11 4KV bus and 11 SRW header

c. 14 4KV bus and 11 SRW header

d. 11 4KV bus and 12 SRW header

QUESTION: 080 (1.00)

The following indications on the Power Range Nuclear Instrumentation for Channel A are observed:

Upper Detector - 27%
Lower Detector - 33%

Which one of the following should be the indicated Channel A ASI?

a. -0.10

b. -0.01

c. +0.01

d. +0.10

QUESTION: 081 (1.00)

Unit 2 is operating at rated power when an inadvertent CSAS is generated. What prevents spray down of the containment?

a. The spray header isolation valves are closed because they require an SIAS to open.

b. The spray header isolation valves are closed because they require both CSAS and SIAS to open.

c. The containment spray pumps are stopped because they require an SIAS to start.

d. The containment spray pumps are stopped because they require both CSAS and SIAS to start.

QUESTION: 082 (2.00)

As pressurizer level is decreasing below the level setpoint, the pressurizer level control system starts the first backup charging pump at _____(a)_____ inches below the setpoint and the second backup charging pump at _____(b)_____ inches below the setpoint. As pressurizer level is returning to the level setpoint, the first backup pump is stopped at _____(c)_____ inches below the setpoint and the second backup pump is stopped at _____(d)_____ inches below the setpoint. (0.5 per blank)

(a) _____

(b) _____

(c) _____

(d) _____

QUESTION: 083 (1.00)

Which one of the following is the reactor power signal used by the Metrascope (Qmet)?

a. Average Qpower

b. Maximum Qpower

c. Average linear range NI power

d. Thermal power (PA912)

QUESTION: 084 (1.00)

Which one of the following correctly states the RCS temperature inputs used in the thermal margin/low pressure (TM/LP) calculator to calculate delta-T power for use in the variable overpower trip unit?

a. Auctioneered high T-hot and auctioneered high T-cold

b. Auctioneered high T-hot and auctioneered low T-cold

c. Average T-hot and auctioneered low T-cold

d. Average T-hot and auctioneered high T-cold

QUESTION: 085 (1.00)

If Reactor Regulating System (RRS) channel X is initially selected, which one of the following correctly states the minimum actions that must be taken to obtain an accurate T-avg signal after a coincident failure of the in-use RTDs in the loop 1 hot leg and loop 1 cold leg.

a. Shift from RRS channel X to RRS channel Y.

b. Select RRS channel Y and shift selector switch HS-111 in the bottom section of 1C06.

c. Select OFF on the loop 1 selector switch for RRS channel X.

d. Shift selector switch HS-111 in the bottom section of 1C06.

QUESTION: 086 (1.00)

Unit 2 is operating at 60 percent power with a hot leg temperature of 590 degrees F. What will be the approximate reading on average core exit thermocouple temperature indication?

a. 566 degrees F

b. 578 degrees F

c. 602 degrees F

d. 614 degrees F

QUESTION: 087 (1.00)

A small feedline break has occurred inside Unit 1 containment and has resulted in containment temperature increasing from 100 degrees F to 160 degrees F. Disregarding any effects from RCS or containment pressure changes, what effect will this increase in containment temperature have on the pressurizer level indicated by LIC-110X/Y?

a. Indicated level will be higher than actual level because the reference leg fluid density decreases.

b. Indicated level will be lower than actual level because the reference leg fluid expands and spills back into the pressurizer.

c. Indicated level will be higher than actual level because the elevated containment temperature causes flashing in the reference leg.

d. Indicated level will be lower than actual level because of the high temperature effects on the differential pressure detector.

QUESTION: 088 (1.00)

Which one of the following describes the operation of the charging pumps when the Charging Pump Selector Switch on 1C07 is in the "13 and 11" position?

a. 13 - running, 11 - first backup, 12 - second backup

b. 12 - running, 11 - first backup, 13 - second backup

c. 13 and 11 - running, 12 - backup

d. 12 - running, 13 - first backup, 11 - second backup

QUESTION: 089 (1.50)

Match the Unit 1 nuclear instrumentation channels in column A to the appropriate type of detector from column B. (Items in column B may be used once, more than once, or not at all. However, each blank in column A has only one answer.) (0.5 each)

Column A (NIS CHANNEL)	Column B (DETECTOR)
_____ a. Wide Range Logarithmic	1. Self-powered neutron detector
_____ b. Power Range Control	2. Compensated ion chamber
_____ c. Power Range Safety	3. Uncompensated ion chamber
	4. Fission chamber
	5. Proportional detector

QUESTION: 090 (2.00)

List FOUR (4) permanent and unrelated (different systems) PROCESS radiation monitors that must be operable per Technical Specifications when Unit 1 is in Mode 1. (0.50 each)

1. _____

2. _____

3. _____

4. _____

QUESTION: 091 (1.00)

Unit 1 is operating at rated power when a reactor trip occurs. The atmospheric steam dump valves quick-open and then modulate fully closed as T-avg decreases below 535 degrees F. If T-avg begins to increase above 535 degrees F again, how will the atmospheric steam dump valves respond?

a. The dump valves will immediately begin to modulate open until T-avg reaches 540 degrees F, at which time they will quick-open.

b. The dump valves will remain closed until T-avg reaches 540 degrees F, at which time they will begin to modulate open.

c. The dump valves will immediately begin to modulate open until T-avg reaches 557 degrees F, at which time they will be fully open.

d. The dump valves will remain closed until T-avg reaches 540 degrees F, at which time they will quick-open.

(********** END OF EXAMINATION **********)

ANSWER: 001 (1.00)

a

REFERENCE:

Q#
CCI-300
GS-NO 85-1
LP-LOR-201-300-90, OBJ 1.2.1
4.1/3.9

194001A102 ..(KA's)

ANSWER: 002 (1.00)

b

REFERENCE:

OBJ - None available
CCI-140F, p. 11
2.5/3.4

194001A103 ..(KA's)

ANSWER: 003 (1.00)

d.

REFERENCE:

T# 1990/05/07
CCI-300J, p. 10
LO - None available
3.6/3.7

194001K101 ..(KA's)

ANSWER: 004 (1.00)

a.

REFERENCE:

T# 1990/05/07
CCI-305B, p. 2
LO - None available
3.1/3.4

194001K105 ..(KA's)

ANSWER: 005 (1.00)

a.

REFERENCE:

10CFR20
LO - None available
2.8/3.4

194001K103 ..(KA's)

ANSWER: 006 (1.00)

c.

REFERENCE:

T# 1990/05/07
CCI-800C, p. 33
LO - None available
3.3
194001K104 ..(KA's)

ANSWER: 007 (1.00)

c.

REFERENCE:

T# 1990/05/07
GSNO SI 88-6
LO - None available
4.3/4.1
194001A113 ..(KA's)

ANSWER: 008 (1.00)

b

REFERENCE:

Q# B03201008
LP-LOR-201-8-89, OBJ 2.1.5
3.1/3.4

194001A115 ..(KA's)

ANSWER: 009 (1.00)

b.

REFERENCE:

T# 1988/12/06
OBJ - None available
CCI-800C, p. 18
2.8/3.4

194001K103 ..(KA's)

ANSWER: 010 (1.00)

b

REFERENCE:

Q# B02204016
LP-LOR-204-112-89, OBJ 4.1
3.7/4.1

194001K102 ..(KA's)

ANSWER: 011 (1.00)

c

REFERENCE:

Q# B03204019
STP-0-102-1
CCI-112
LP-LOR-204-112-89, OBJ 1.1
3.7/4.1

194001K102 ..(KA's)

ANSWER: 012 (1.00)

a

REFERENCE:

Q# B03204021
CCI-1121
LP-LOR-204-112-89, OBJ 1.2, 1.3
3.7/4.1

194001K102 ..(KA's)

ANSWER: 013 (1.00)

b

REFERENCE:

Q#
TS 4.0.2 LCO
TS 4.0.3 LCO
LP-LOR-204-1-88, OBJ 3.0
LP-LOR-201-3-1004-88, OBJ 2.15
3.1/4.1

194001A112 ..(KA's)

ANSWER: 014 (1.00)

a

REFERENCE:

OBJ - None available
Q#
LOR-348-1-90
2.8/4.1

194001A111 ..(KA's)

ANSWER: 015 (1.00)

b

REFERENCE:

Q#
LO 2.0
LOR-348-1-90
4.1/3.9

194001A102 ..(KA's)

ANSWER: 016 (1.00)

c

REFERENCE:

Q# B03204025
CCI-118
LP-LOR-204-1-88, OBJ 2.0
LP-LOR-201-3-1004-88, OBJ 5.2
LP-LOR-201-4-1005-99, OBJ 5.2
LP-LOR-201-5-1003-88, OBJ 10b
3.4/3.4

194001A106 ..(KA's)

ANSWER: 017 (1.50)

1. 11 CST
2. 21 CST
3. Firewater (0.4 for source, 0.1 for priority)

REFERENCE:

OBJ - None available
EOP-7, p. 12
4.5/4.4

000054A101 ..(KA's)

ANSWER: 018 (1.00)

c.

REFERENCE:

T# 1990/05/07
LP-RO-60-1-2, LO 2.01
LP-RO-60-1-2, p.28-30
SD-60, p. 28
3.7/3.9

000003A201 ..(KA's)

ANSWER: 019 (1.00)

b.

REFERENCE:

T# 1990/05/07
OI-12A, p. 4
LP-RO-103-1-0, p. 28, 29
LP-RO-103-1-0, LO 3.5
LER 84-03
4.4/4.6

000054K304 ..(KA's)

ANSWER: 020 (1.00)

b

REFERENCE:

OBJ - None available
EOP-0 Basis Document, page 8
3.8/3.9

000007G012 ..(KA's)

ANSWER: 021 (1.00)

a

REFERENCE:

OBJ - None available
AOP-9A, p. 10
4.1/4.2

000068G010 ..(KA's)

ANSWER: 022 (1.00)

b

REFERENCE:

OBJ - None available
EOP-4, step I.
4.2/4.7

000040A201 ..(KA's)

ANSWER: 023 (1.00)

c

REFERENCE:

OBJ - None availab'e
EOP-2, page 3
3.8/4.0

000056A218 ..(KA's)

ANSWER: 024 (1.00)

c

REFERENCE:

OBJ - None available
EOP-3, Basis Document, p. 12
4.0/4.4

000074K311 ..(KA's)

ANSWER: 025 (1.00)

d.

REFERENCE:

T# 1990/05/07
OBJ - None available
RO-202-7G-2 p. 9
2.6/2.9

000051G011 ..(KA's)

ANSWER: 025 (1.00)

b.

REFERENCE:

T# 1988/12/06
OBJ - None available
AOP-6E, Loss of Refueling Pool Level, Pg 5
3.5/4.1

000036K101 ..(KA's)

ANSWER: 027 (1.00)

b.

REFERENCE:

T# 1988/12/06
OBJ - None available
SD-38, p. 25,26
4.2/4.2

000011A111 ..(KA's)

ANSWER: 028 (1.00)

b.

REFERENCE:

T# 1988/12/06
OBJ - None available
LOR-201-5-88
4.4/4.6

000011K312 ..(KA's)

ANSWER: 029 (3.00)

1. Feedwater isolation valves.
2. S/G blowdown valves.
3. AFW steam supply valves.
4. AFW block valves.
5. Atmospheric dump valves.
6. Main steamline upstream drains. (0.50 each)

REFERENCE:

OBJ - None available
EOP-4, p. 5
4.5/4.7

000040A104 ..(KA's)

ANSWER: 030 (2.00)

a. 2 (0.50 each)
b. 4
c. 1
d. 1

REFERENCE:

OBJ - None available
CC SDs #32, pg 15; #39, pg 21; #41, Fig A-7 to A-9
CC AOP-7D, pg 1
2.9/3.3

000055A208 ..(KA's)

ANSWER: 031 (1.00)

c

REFERENCE:

Q# B02005045
LP-LOR-201-3-88, OBJ 1.2
4.2/4.6

000054K304 ..(KA's)

ANSWER: 032 (1.00)

c

REFERENCE:

Q# B02005050
LP-LOR-201-6-88, OBJ 2.1
4.2/4.5

000038K306 ..(KA's)

ANSWER: 033 (1.00)

a

REFERENCE:

Q# B02007016
LP-LOR-201-4-1005-88, OBJ 2.11
LP-LOR-201-6-1002-88, OBJ 7.9
LP-LOR-201-322-3017B-0, OBJ 25.12
LP-LOR-322-3024A-1, OBJ 16.9
4.5/4.7

000040K304 ..(KA's)

ANSWER: 034 (1.00)

b

REFERENCE:

Q# B02060009
LP-LOR-202-3023A, OBJ 1.4 & 3.6
LP-LOR-322-30008C-1, OBJ 5.1
3.8/4.1

000003K304 ..(KA's)

ANSWER: 035 (1.00)

d

REFERENCE:

Q# B02063005
LP-LOR-201-3-1004-88, OBJ 2.20
LP-LOR-201-4-1005-88, OBJ 2.1
4.0/4.6

000007K301 ..(KA's)

ANSWER: 036 (1.00)

c

REFERENCE:

Q# B02069001
LP-LOR-202-9-88, OBJ 2.3
LP-LOR-69-1-88, OBJ 3.05
3.4/3.4

000005A105 ..(KA's)

ANSWER: 037 (1.00)

b

REFERENCE:

Q# B02201016
LP-LOR-201-6-88, OBJ 2.2
4.2/4.5

000038K306 ..(KA's)

ANSWER: 038 (1.00)

a

REFERENCE:

Q# B02201020
LP-LOR-201-5-1003-88, OBJ 7f
LP-LOR-201-6-1002-88, OBJ 7.4
4.2/4.6

000009A236 ..(KA's)

ANSWER: 039 (1.00)

d

REFERENCE:

Q#
LO 1.2
LOR-63-1-90
3.2/3.8

000022A201 ..(KA's)

ANSWER: 040 (1.00)

d

REFERENCE:

LO- None available
EOP-6, p. 10
4.4/4.6

000038A203 ..(KA's)

ANSWER: 041 (1.00)

b

REFERENCE:

LO 5.1
LOR-348-1-90
3.9/4.3

000011A211 ..(KA's)

ANSWER: 042 (1.00)

a

REFERENCE:

Q#
EOP-7
LP-LOR-201-7-89, OBJ 2.1
4.3/4.6

000055K302 ..(KA's)

ANSWER: 043 (1.00)

d

REFERENCE:

Q#
AOP-3B, Rev 8, page 12 of 17, caution under step 7
LP-LOR-202-3B-89, OBJ 2.3.1

3.9/4.3

000025K101 ..(KA's)

ANSWER: 044 (1.00)

d

REFERENCE:

Q#
EOP-2 and Basis document
EOP-7 and Basis document
LP-LOR-201-2-88, OBJ 9.1
LP-LOR-201-7-89, OBJ 3.3
4.4/4.7

000056K302 ..(KA's)

ANSWER: 045 (2.00)

a. 3
b. 1
c. 4 (0.5 each)
d. 2

REFERENCE:

Q# B02005032
OI-IA, Rev 13
LP-LOR-322-3008C-1, OBJ 2.3
LP-LOR-201-7-89, OBJ 5.3
4.0/4.2

000015A122 ..(KA's)

ANSWER: 046 (1.00)

d

REFERENCE:

LO 1.1
LOR-202-7A-90
U2 EOP-0
4.2/4.1

000007G010 ..(KA's)

ANSWER: 047 (1.00)

d

REFERENCE:

AOP-7D
LP-LOR-202-7D-90, OBJ 3.1
3.1/3.3

000065G006 ..(KA's)

ANSWER: 048 (1.00)

c

REFERENCE:

Q#
AOP-9A
LP-LOR-202-9A-2, OBJ 8.0
4.2/4.5

000068K318 ..(KA's)

ANSWER: 049 (1.00)

b

REFERENCE:

Q#
AOP-3B
TECH SPEC 3.4.6.2
LP-LOR-3B/6E-90, OBJ 1.2
3.1/3.9

000037G008 ..(KA's)

ANSWER: 050 (1.00)

a

REFERENCE:

Q#
AOP-7B
LO 1.2
LOR-202-7B-90, OBJ 1.2
4.0/4.2

000062K303 ..(KA's)

ANSWER: 051 (1.00)

b

REFERENCE:

OBJ - None available
OI-17C, p. 10
3.6/3.9

000059A205 ..(KA's)

ANSWER: 052 (1.00)

b

REFERENCE:

OBJ - None available
CCNPP Tech. Specs., T.S. 3.4.8 Bases
2.4/3.1

000076K301 ..(KA's)

ANSWER: 053 (1.00)

b

REFERENCE:

OBJ - None available
EOP-0, p. 4
4.0/4.0

000024G010 ..(KA's)

ANSWER: 054 (1.00)

c

REFERENCE:

OBJ - None available
SD-34, AFW System, p. 12
3.7/4.3

000068K303 ..(KA's)

ANSWER: 055 (1.00)

a

REFERENCE:

LOR-200-27e-1000-90, OBJ 2.0
4.4/4.6

000001A205 ..(KA's)

ANSWER: 056 (1.00)

a

REFERENCE:

OBJ - None available
U1 Tech. Specs. Bases, p, B5-2
2.5/3.8

026000G006 ..(KA's)

ANSWER: 057 (1.00)

c

REFERENCE:

LP-RO-103-1-0, OBJ 1.3, 1.4, 1.5
SD-32, p. 22
3.0/3.3

059000A211 ..(KA's)

ANSWER: 058 (1.00)

c

REFERENCE:

Q#
EOP-2, 7
EOP Attachment (1i,
LP-LOR-201-1-90, OBJ .2
3.6/3.8

061000G013 ..(KA's)

ANSWER: 059 (1.00)

b

REFERENCE:

Q# B02005037
LP-301-1-88, OBJ 2.02
LP-201-6-1002-88, OBJ 7.12
4.3/4.5

002000A402 ..(KA's)

ANSWER: 060 (1.00)

b

REFERENCE:

Q# B02054003
LP-LOR-54-1-89, OBJ 1.2
4.1/4.4

062000K302 ..(KA's)

ANSWER: 061 (1.00)

a

REFERENCE:

Q# B02060014
LP-LOR-344-2-89, OBJ 1.1, 1.1.1
3.2/3.5

001010A208 ..(KA's)

ANSWER: 062 (1.00)

b

REFERENCE:

Q# B02069002
LP-LOR-69-1-88, OBJ 2.01, 2.03
3.4/3.7

001010A201 ..(KA's)

ANSWER: 063 (1.00)

a

REFERENCE:

Q#
AOP-7B
LP-LOR-202-7B-90, OBJ 2.1
3.5/3.7

076000A201 ..(KA's)

ANSWER: 064 (1.00)

c

REFERENCE:

Q# B02206010
NEOG-2
LP-LOR-202-7H-89, OBJ 3.1
3.5/3.7

015000A104 ..(KA's)

ANSWER: 065 (1.00)

c

REFERENCE:

Q#
LO 1.3
LOR-200-27C&E-90
2.6/3.2

062000K401 ..(KA's)

ANSWER: 066 (1.00)

1. The unaffected unit's RWT (0.5 each)
2. The containment floor

REFERENCE:

OBJ - None available
Q#
LOR-202-3B/6E-90
2.9/3.7

034000A102 ..(KA's)

ANSWER: 067 (1.00)

d

REFERENCE:

Q#
LO 2.1
LOR-202-3B/6E-90
3.6/3.9

073000K101 ..(KA's)

ANSWER: 068 (1.00)

c

REFERENCE:

Q#
IO 1.00
LOR-348-1-90
CCI-300
3.3/3.7

013000K410 ..(KA's)

ANSWER: 069 (2.00)

a. SIAS, CSAS, CIS, SGIS (0.25 each)

b. SIAS, CIS (0.25 each)

c. SGIS, AFAS (0.25 each)

REFERENCE:

OBJ - None available
SD-63 pp. 45-60 RO-34-1-2 pg. 7
3.8/3.9

012000A301 ..(KA's)

ANSWER: 070 (1.00)

d

REFERENCE:

Q#
LOR-201-5-88, OBJ 2.1
3.6/3.4

010000A402 ..(KA's)

ANSWER: 071 (1.00)

a

REFERENCE:

Q#
LOR-201-3-1004-88, OBJ 2.14
3.1/3.4

022000K402 ..(KA's)

ANSWER: 072 (2.00)

1. Overspeed
2. Lube oil pressure low
3. Crankcase High Pressure (Any 4 at 0.50 each)
4. Loss of Generator Field
5. CTCR (Cranking Timer Control Relay)
6. Generator Differential
7. Generator Underfrequency

REFERENCE:

Q#
LOR-201-6-1002-88, OBJ 7.16
3.9/4.2

064000K402 ..(KA's)

ANSWER: 073 (1.00)

d

REFERENCE:

Q#
LOR-322-3008C-1, OBJ 6.1
3.8/3.9

004010A207 ..(KA's)

ANSWER: 074 (1.00)

a

REFERENCE:

Q#
OI-26B
LP-LOR-54-1-89, OBJ 2.1a
3.1/3.5

062000K410 ..(KA's)

ANSWER: 075 (1.00)

b

REFERENCE:

Q#
OP-1 General Precautions
FSAR Chapter 14
LP-LOR-322-3008C-1, OBJ 1.2
3.9/4.2

004010A203 ..(KA's)

ANSWER: 076 (1.00)

b

REFERENCE:

Q#
EOP-5
Attachment 12
CEOG-NU0010
LP-LOR-201-3-1004-88, OBJ 2.24
LP-LOR-201-3031-89, OBJ 3a
LP-LOR-201-4-1005-88, OBJ 2.9
4.2/4.3

006030A102 ..(KA's)

ANSWER: 077 (1.00)

c

REFERENCE:

Q#
ECP-5
EOP Attachment 1
LP-LOR-201-7-89, OBJ 4.1
3.4/3.4

003000A107 ..(KA's)

ANSWER: 078 (1.00)

a

REFERENCE:

Q#
AOP-9A
LP-LOR-202-9A-2, OBJ 5.0
3.1/3.2

078000A301 ..(KA's)

ANSWER: 079 (1.00)

d

REFERENCE:

Q#
LO 1.3
LOR-202-7B-90
2.7/2.7

076000K201 ..(KA's)

ANSWER: 080 (1.00)

d

REFERENCE:

OBJ - None available
Tech. Specs., Pg 1-5
3.4/3.9

001000G001 ..(KA's)

ANSWER: 081 (1.00)

a.

REFERENCE:

T# 1988/12/06
LP-RO-07-1-1, p. 56
LP-RO-07-1-1, LO 04.K501
SD-7, figure 7-9
4.3/4.5

026000A301 ..(KA's)

ANSWER: 082 (2.00)

(a) 9
(b) 14 (0.5 each, all setpoints +/- 1)
(c) 4
(d) 6

REFERENCE:

T# 1990/05/07
OBJ - None available
SD 62 p. 15
3.2/3.3

011000A303 ..(KA's)

ANSWER: 083 (1.00)

b.

REFERENCE:

T# 1990/05/07
OBJ - None available
LP RO-59-1-4 p. 37
3.1/3.5

012000K603 ..(KA's)

ANSWER: 084 (1.00)

d.

REFERENCE:

T# 1990/05/07
OBJ - None available
LP RO-59-1-4 p. 17
3.1/3.2

012000A205 ..(KA's)

ANSWER: 085 (1.00)

c.

REFERENCE:

T# 1990/05/07
OBJ - None available
LP RO-58-2-2 p. 12
3.0/3.1

016000A201 ..(KA's)

ANSWER: 086 (1.00)

b.

REFERENCE:

T# 1990/05/07
LP-RO-64-1-1, p. 15
LP-RO-64-1-1, 3.01a
LO - None available
3.8/4.1

017020A301 ..(KA's)

ANSWER: 087 (1.00)

a.

REFERENCE:

T# 1990/05/07
LP-RO-62-1-2, p. 9
LP-RO-62-1-2,
EOPs, attachment 9
LO - None available
3.7/3.8

011000A209 ..(KA's)

ANSWER: 088 (1.00)

d

REFERENCE:

T# 1990/05/07
SD-6, p. 25
LO - None available
3.8/3.4

004010A404 ..(KA's)

ANSWER: 089 (1.50)

a. 4
b. 3 (0.5 each)
c. 3

REFERENCE:

OBJ - None available
SD-57
2.9/3.2

015000K601 ..(KA's)

ANSWER: 090 (2.00)

1. RI-2191 (Gaseous Waste Discharge)
2. RI-2201 (Liquid Waste Discharge)
3. RI-4014/4095 (S/G Blowdown) (any 4 at 0.50 each)
4. RI-5280/5281 (Containment Particulate and Gaseous)
5. RI-5350 (Control Room Vent.)
6. RI-5415 (Main Vent Gaseous/WRNG/WRNG Charcoal Iodine and Part.)

REFERENCE:

OBJ - None available
SD-15
3.0/3.6

072000G005 ..(KA's)

ANSWER: 091 (1.00)

b

REFERENCE:

OBJ - None available
SD-19, p. 18
2.7/2.9
041020K603 ..(KA's)

(********** END OF EXAMINATION **********)

ATTACHMENT 3

SIMULATOR FIDELITY REPORT

Facility Licensee: Baltimore Gas and Electric
Charles Center
P.O. Box 1475
Baltimore, Maryland 21203-1475

Facility Docket Nos.: 50-317/318

Operating Tests Administered on: October 30, 1990

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of non-compliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

During the conduct of the simulator portion of the operating tests, the following items were observed:

Through the conduct of three different simulator scenarios, the simulator appeared to properly model normal (i.e. power increases or decreases), abnormal (i.e. instrument and component failures) and emergency conditions which included a faulted steam generator in containment, a ruptured steam generator, and a small break LOCA. Also, in each scenario, various pieces of equipment were initially out of service or, as planned, failed to start when needed. In each scenario, the simulator appeared to properly model RCS and secondary responses as indicated by instrumentation that provided reasonable feedback to the operator candidates.

Generally the simulator performed well and did not "lock-up" once during the simulator portion of the scenarios. However, the following anomalies were noted:

Unrelated to the inserted malfunctions, alarms associated with the RCPs and the steam generator feed pumps appeared on the alarm monitor during the first and second scenarios.

For an unexplained reason, the metroscope was not providing any information regarding CEA location after the simulator was set up for the second scenario.

The simulator's copy of Technical Specifications contained two incorrect pages due to improper updating.