

ENCLOSURE 3



Carolina Power & Light Company
PO Box 10429
Southport NC 28461

Roy A. Anderson
Vice President
Brunswick Nuclear Plant
910 457-2496

November 4, 1994

Serial: BSEP 94-0445

Mr. Stewart D. Ebner
Regional Administrator
ATTENTION: Mr. T. A. Peebles
United States Nuclear Regulatory Commission
101 Marietta Street, N. W., Suite 2900
Atlanta, GA 30323

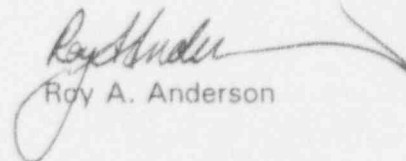
BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NO. 50-325 & 50-324/LICENSE NO. DPR-71 & DPR-62
COMMENTS ON NRC LICENSE EXAMINATION

Dear Mr. Ebner:

This letter provides the NRC Staff with the enclosed examination comments for the examination given on October 24, 1994 at the Brunswick Nuclear Plant.

If you have any questions regarding this submittal please contact Mr. M. S. Williams at (910) 457-2056.

Sincerely,



Roy A. Anderson

SHC/shc (examcom.ltr)

Attachments

cc: NRC Document Control Desk
Mr. P. D. Milano, NRC/NRR Senior Project Manager - Brunswick
Mr. D. C. Payne, NRC Region II, Operations Branch
Mr. C. A. Patterson, NRC Senior Resident Inspector - Brunswick
The Honorable H. Wells, Chairman - North Carolina Utilities Commission

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ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
COMMENTS ON NRC LICENSE EXAMINATION

BRUNSWICK NUCLEAR PLANT

COMMENTS ON NRC LICENSE EXAMINATION

Reactor Operator (RO) question No. 79 / Senior Reactor Operator (SRO) question No. 75:

NRC Reference: SM-305-A, Fuel Handling Student Study Material, Rev 0, pg 32,
LO 16.b, KA 295023K204

There are two correct answers. The intent of the question was to test knowledge of the "All Rods In" interlock circuitry for Refueling. Choice "C" is a correct answer. The plant conditions given in the question have SRMs A and C below the minimum counts of 3 cps for refueling. This leaves SRMs B and D to satisfy Technical Specification 3.9.2. These two instruments are in physically opposite quadrants of the core. As such, these SRMs can not satisfy the requirement for two operable SRMs, one in the quadrant where fuel is being moved, and one in an adjacent quadrant. Choice "B" is also a correct answer.

Recommend accepting answers "B" and "C".

B. CONDITIONS MONITORED

The refueling interlock circuitry senses various refueling bridge conditions and control rod positions. Depending on the sensed condition, interlocks may be actuated which prevent fuel movement (Bridge Reverse Motion Stop, Main Hoist Block, Auxiliary Hoist Block) and/or prevent control rod withdrawal (Rod Block). The circuitry senses:

- * ALL RODS IN
- * BRIDGE NEAR/OVER REACTOR VESSEL
- * ANY HOIST LOADED
- * MAIN HOIST NOT FULL-UP

ALL RODS IN - To minimize loading fuel into a cell containing a withdrawn control rod, it is required that all control rods are fully inserted when fuel is being loaded into or removed from the reactor core.

The position for each control rod is established by the closure of full-in magnetically-operated reed switches within the control rod drive mechanism. The rod full-in reed switch must be closed for *each* control rod before the ALL RODS IN signal is generated.

BRIDGE NEAR/OVER REACTOR VESSEL - The assumption is that the refueling bridge is in a position where fuel can be loaded into the reactor vessel.

The refueling bridge is provided with two limit switches attached to the drive housing (LS1 & LS2). The switches actuate before the refueling bridge or any of its hoists are physically located over the reactor core providing indication that the bridge is near or over the reactor vessel.

LS1 is active when the reactor mode switch is in REFUEL.

LS2 is active when the reactor mode switch is in STARTUP.

ANY HOIST LOADED - The assumption is that a fuel assembly is being moved using the refueling bridge.

Each hoist (Main, Monorail, and Frame-mounted) provide a hoist loaded signal to the refueling interlock circuitry. Load sensing is accomplished by Dillon Force Switches for each hoist; the switches are actuated at 720# for the Main Hoist and at 325# for the Monorail and Frame-mounted Hoists providing positive indication whenever fuel is loaded on any hoist.

MAIN HOIST NOT FULL-UP - Indicates that the Main Hoist is being lowered for fuel movement even it is not loaded.

QUESTION: 079 (1.00)

Given the following plant conditions:

- Reactor has been shutdown for 24 hours
- Control rod 13-12 indicates notch "00" but does not indicate a full in, green light
- SRMs A and C are reading 2 cps
- SRMs B and D are reading 5 and 8 counts respectively
- Fuel pool level is 23 feet 2 inches above the fuel assemblies seated in the spent fuel storage rack

With the above conditions which one of the following would prevent removal of spent fuel from the reactor core, either procedurally or because of a refueling interlock?

- a. The level of water above the fuel assemblies when seated in the spent fuel storage rack is not high enough.
- b. The required number of SRM channels are not available per Technical Specifications.
- c. The failure of rod 13-12 to generate a rod full in signal to RMCS.
- d. The required time before spent fuel can be removed from the reactor core has not elapsed.

QUESTION: 075 (1.00)

Given the following plant conditions:

- Reactor has been shutdown for 24 hours
- Control rod 13-12 indicates notch "00" but does not indicate a full in, green light
- SRMs A and C are reading 2 cps
- SRMs B and D are reading 5 and 8 counts respectively
- Fuel pool level is 23 feet 2 inches above the fuel assemblies seated in the spent fuel storage rack

With the above conditions which one of the following would prevent removal of spent fuel from the reactor core, either procedurally or because of a refueling interlock?

- a. The level of water above the fuel assemblies when seated in the spent fuel storage rack is not high enough.
- b. The required number of SRM channels are not available per Technical Specifications.
- c. The failure of rod 13-12 to generate a rod full in signal to RMCS.
- d. The required time before spent fuel can be removed from the reactor core has not elapsed.

REFUELING OPERATIONS

3/4.9.2 INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.9.2 During CORE ALTERATIONS, the requirements for the source range monitors (SRMs) shall be:

- a. Two SRMs* shall be OPERABLE, one in the core quadrant where fuel is being moved and one in an adjacent quadrant. For an SRM to be considered OPERABLE, it shall be inserted to the normal operating level and shall have a minimum of 3 cps except as specified in d and e below.
- b. The SRMs shall give a continuous visual indication in the Control Room.
- c. The "shorting links" shall be removed from the RPS circuitry prior to and during the time any control rod is withdrawn** and shutdown margin demonstrations.
- d. During a core SPIRAL UNLOAD the count rate may drop below 3 cps.
- e. Prior to a core SPIRAL RELOAD, up to four fuel assemblies shall be loaded into different control cells containing control blades around each SRM to obtain 3 cps. Until these assemblies have been loaded, the 3 cps count rate is not required.

APPLICABILITY: OPERATIONAL CONDITION 5

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and fully insert all insertable control rods. The provisions of Specification 3.0.3 are not applicable.

* The use of special movable detectors during CORE ALTERATIONS in place of the normal SRM nuclear detectors is permissible as long as these special detectors are connected to the normal SRM circuits.

** Not required for control rods removed per Specifications 3.9.10.1 or 3.9.10.2.

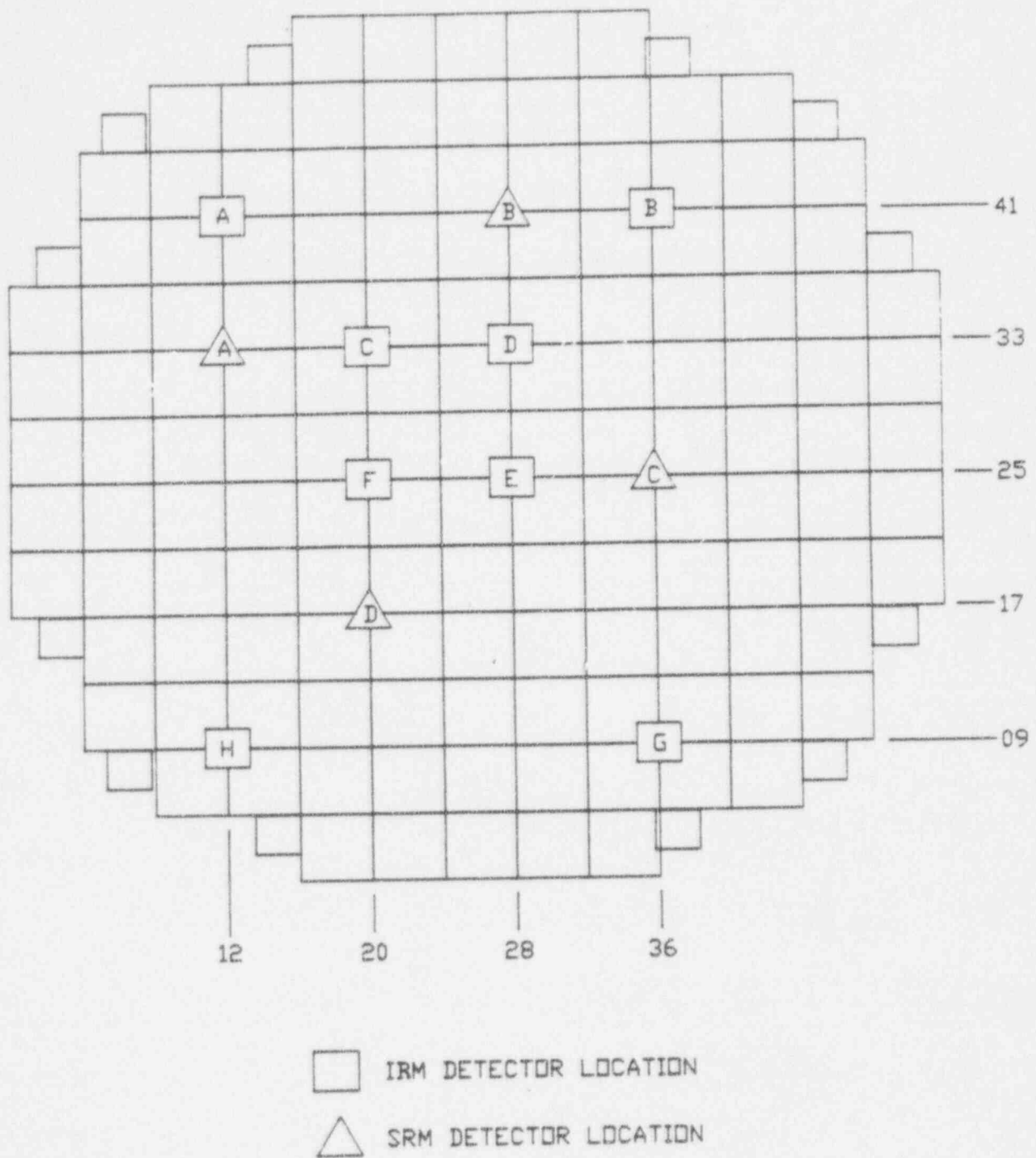


Figure 2 - IN-CORE INSTRUMENTATION LOCATION

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Brunswick 94-301

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Nuclear Regulatory Commission
Operator Licensing
Examination

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U. S. NUCLEAR REGULATORY COMMISSION
SITE SPECIFIC EXAMINATION
REACTOR OPERATOR LICENSE
REGION 2

Brunswick 94-301
Master Exam

CANDIDATE'S NAME: _____
FACILITY: Brunswick 1 & 2
REACTOR TYPE: BWR-GE4
DATE ADMINISTERED: 94/10/24

INSTRUCTIONS TO CANDIDATE:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

| <u>TEST VALUE</u> | <u>CANDIDATE'S SCORE</u> | <u>%</u> | |
|-------------------|------------------------------|---------------|--------|
| <u>100.00</u> | | <u> </u> % | TOTALS |
| | <u>FINAL GRADE</u> | | |

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

Candidate's Signature

MASTER COPY

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

| | | | | | | | | | | | |
|-----|---|---|---|---|-----|-----|---|---|---|---|-----|
| 001 | a | b | c | d | ___ | 023 | a | b | c | d | ___ |
| 002 | a | b | c | d | ___ | 024 | a | b | c | d | ___ |
| 003 | a | b | c | d | ___ | 025 | a | b | c | d | ___ |
| 004 | a | b | c | d | ___ | 026 | a | b | c | d | ___ |
| 005 | a | b | c | d | ___ | 027 | a | b | c | d | ___ |
| 006 | a | b | c | d | ___ | 028 | a | b | c | d | ___ |
| 007 | a | b | c | d | ___ | 029 | a | b | c | d | ___ |
| 008 | a | b | c | d | ___ | 030 | a | b | c | d | ___ |
| 009 | a | b | c | d | ___ | 031 | a | b | c | d | ___ |
| 010 | a | b | c | d | ___ | 032 | a | b | c | d | ___ |
| 011 | a | b | c | d | ___ | 033 | a | b | c | d | ___ |
| 012 | a | b | c | d | ___ | 034 | a | b | c | d | ___ |
| 013 | a | b | c | d | ___ | 035 | a | b | c | d | ___ |
| 014 | a | b | c | d | ___ | 036 | a | b | c | d | ___ |
| 015 | a | b | c | d | ___ | 037 | a | b | c | d | ___ |
| 016 | a | b | c | d | ___ | 038 | a | b | c | d | ___ |
| 017 | a | b | c | d | ___ | 039 | a | b | c | d | ___ |
| 018 | a | b | c | d | ___ | 040 | a | b | c | d | ___ |
| 019 | a | b | c | d | ___ | 041 | a | b | c | d | ___ |
| 020 | a | b | c | d | ___ | 042 | a | b | c | d | ___ |
| 021 | a | b | c | d | ___ | 043 | a | b | c | d | ___ |
| 022 | a | b | c | d | ___ | 044 | a | b | c | d | ___ |
| | | | | | | 045 | a | b | c | d | ___ |

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

046 a b c d ____

MULTIPLE CHOICE

047 a b c d ____

048 a b c d ____

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090 a b c d ____

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

091 a b c d ____

MULTIPLE CHOICE

092 a b c d ____

093 a b c d ____

094 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

095 a b c d ____

096 a b c d ____

097 a b c d ____

098 a b c d ____

099 a b c d ____

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

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination, the following rules apply:

1. Cheating on the examination will result in a denial of your application and could result in more severe penalties.
2. After you complete the examination, 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.
3. To pass the examination, you must achieve a grade of 80 percent or greater.
4. The point value for each question is indicated in parentheses after the question number.
5. There is a time limit of 4 hours for completing the examination.
6. Use only black ink or dark pencil to ensure legible copies.
7. Print your name in the blank provided on the examination cover sheet and the answer sheet.
8. Mark your answers on the answer sheet provided and do not leave any question blank.
9. If the intent of a question is unclear, ask questions of the examiner only.
10. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.
11. When you complete the examination, assemble a package including the examination questions, examination aids, and answer sheets and give it to the examiner or proctor. Remember to sign the statement on the examination cover sheet.
12. After you have turned in your examination, leave the examination area as defined by the examiner.

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QUESTION: 001 (1.00)

Which one of the following describes an "intent" temporary procedure change?

Procedure intent is changed if a temporary procedure change:

- a. places the plant at a lower power level.
- b. adds a new method to start a pump.
- c. widens the nuclear boiler water level operating range.
- d. modifies the text alongside a Q/C holdpoint.

QUESTION: 002 (1.00)

Which one of the following is the preferred method of installing a Temporary Caution Tag on a RTGB panel?

- a. Caution tags are placed on the vertical portion of the RTGB as close as possible to the affected component, with the caution tag sheet placed in an orange colored book kept in an annunciator procedure holder.
- b. A numbered orange caution tag sticker is placed on or near the affected component and the caution tags are placed on the horizontal portion of the RTGB.
- c. A numbered orange caution tag sticker is placed on or as near as possible to the affected component, with the caution tag sheet placed in an orange colored book kept in an annunciator procedure holder.
- d. A numbered orange caution tag sticker is placed on the component along with the caution tags, which are folded as necessary to prevent obstructing of controls and indications.

QUESTION: 003 (1.00)

What action is required when independent verification is required for hanging a clearance?

- a. Each verification must always be separated by time and distance, to ensure independence.
- b. Only the second operator is required to initial the clearance tag sheet.
- c. Independent verification must be used when restoring equipment with a completed valve and electrical lineup to service.
- d. Management oversight verification may be used in place of independent verification, for Control Room components.

QUESTION: 004 (1.00)

Which one of the following is the maximum time period allowed for Temporary Plant Modifications (TPMs) from date of installation, without requiring an extension?

- a. Three months
- b. Six months
- c. Twelve months
- d. 18 months

QUESTION: 005 (1.00)

A High Pressure Coolant Injection (HPCI) system motor operated valve, being stroke timed in accordance with the Inservice Test (IST) Program, is found to exceed the full stroke time limit on the first attempt.

Which one of the following actions is required?

- a. Do not stroke the valve a second time, declare the valve inoperable and generate a WR/JO.
- b. Stroke the valve a second time, if satisfactory the valve is operable.
- c. Reverify the system test alignment is correct, then attempt a second stroke test of the valve.
- d. Manually operate the valve through a complete cycle to check for binding, then stroke the valve a second time.

QUESTION: 006 (1.00)

Which one of the following indications on an annunciator window, indicates the annunciator card has been pulled?

- a. Black Dot
- b. Yellow Dot
- c. Red Dot
- d. Blue Dot

QUESTION: 007 (1.00)

You are performing a valve lineup on a valve with an orange handwheel, in a system requiring independent verification.

Which one of the following describes the requirements that apply to this valve?

- a. The orange handwheel designates this valve as a throttle valve, the independent verifier should watch you position it.
- b. Independent verification requirements are waived for this valve, due to excessive radiation levels.
- c. This valve is normally full open and should be stroked in the clockwise direction one-half turn and then reopened.
- d. The valve handwheel should be turned in the counterclockwise direction to verify position.

QUESTION: 008 (1.00)

Which one of the following process computer indications indicates a failed or bypassed LPRM on the "LPRM Readings Edit" function?

- a. Magenta "V"
- b. Blue "nnS"
- c. Yellow "nn"
- d. Red "++"

QUESTION: 009 (1.00)

During operation at rated conditions the Control Operator reports an increase in conductivity on P603 Conductivity Recorder, G31-CRS-R601 and a decrease in reactor power of 4%.

Which one of the following is the cause of these indications?

This condition indicates that a:

- a. reactor water cleanup resin bed is exhausted, releasing accumulated silica.
- b. main condenser tube has failed.
- c. resin injection has occurred.
- d. condensate deep bed demineralizer resin bed is exhausted, releasing accumulated boron.

QUESTION: 010 (1.00)

Which one of the following is the 10 CFR 20 definition of "Total Effective Dose Equivalent (TEDE)?"

It is the sum of the:

- a. Shallow Dose Equivalent, Whole Body (SDE, WB) and the Committed Effective Dose Equivalent (CEDE).
- b. Deep Dose Equivalent (DDE) and the Committed Dose Equivalent (CDE).
- c. Deep Dose Equivalent (DDE) and the Committed Effective Dose Equivalent (CEDE).
- d. Shallow Dose Equivalent, Max Extremity (SDE, ME) and the Deep Dose Equivalent (DDE).

QUESTION: 011 (1.00)

Given the following Conditions:

- 21 year old radiation worker
- Current NRC Forms 4 and 5 are on file for the worker
- The worker has received 47.0 Rem Committed Dose Equivalent (CDE) for the year
- The workers current annual Deep Dose Equivalent (DDE) dose is 0.0 Rem

Which one of the following is the maximum amount of DDE that the worker can receive for the remainder of the year, in accordance with 10 CFR 20?

- a. 2.5 Rem
- b. 3.0 Rem
- c. 8.0 Rem
- d. 13.0 Rem

QUESTION: 012 (1.00)

Which one of the following is the minimum time period requiring abstinence from alcohol, preceding any scheduled shift in accordance with 10 CFR 26, "Fitness for Duty Program?"

- a. 3 hours
- b. 5 hours
- c. 6 hours
- d. 8 hours

QUESTION: 013 (1.00)

Which one of the following designates a Main Control Room annunciator that indicates an Emergency Operating Procedure entry condition?

- a. Red backlighting with blue bar.
- b. Red backlighting with amber bar.
- c. White backlighting with amber bar.
- d. White backlighting with blue bar.

QUESTION: 014 (1.00)

Which one of the following describes the dispersement of the 50 gpm control rod drive cooling water flow, assuming no control rod movement?

- a. All 50 gpm passes through the Pressure Control Valve (F003).
- b. 44 gpm through the Pressure Control Valve (F003) and 6 gpm to the recirculation pump seal purge.
- c. 44 gpm through the Pressure Control Valve (F003), 2 gpm through the insert stabilizing valves and 4 gpm through the withdraw stabilizing valves.
- d. 44 gpm through the Pressure Control Valve (F003), 4 gpm through the insert stabilizing valves and 2 gpm through the withdraw stabilizing valves.

QUESTION: 015 (1.00)

With the plant at normal operating pressure and temperature the operator partially closes the control rod drive Pressure Control Valve (F003).

Which one of the following describes the effect this will have on control rod speeds?

Partially closing the pressure control valve:

- a. decreases control rod insertion speed.
- b. increases control rod withdrawal speed.
- c. decreases control rod scram speed.
- d. increases control rod scram speed.

QUESTION: 016 (1.00)

Which one of the following conditions will cause the reactor manual control system to initiate a SELECT BLOCK?

- a. Momentarily positioning (< 2 seconds) the RMCS timer test switch to TEST.
- b. The operator attempts to select a rod that has a withdraw error.
- c. The operator attempts to select a rod that has an insert error.
- d. Withdraw signal lasting for more than 2 seconds with the rod out notch override switch in OFF.

QUESTION: 017 (1.00)

Given the following plant conditions:

- Unit 2 is operating at 100% power
- Annunciator, "SPEED CONTROL A SIGNAL FAIL" is received for the "A" reactor recirculation pump

Which one of the following is the expected effect on operation of the "A" recirculation pump?

The "A" recirculation pump speed:

- a. will run back to minimum due to the low output signal from the controller.
- b. can only be changed by the individual pump controller at P603.
- c. will remain at its existing value until the scoop tube lock can be reset.
- d. will not change due to loss of power to the scoop tube positioner.

QUESTION: 018 (1.00)

During operation at 65% reactor power, a spurious electrical fault causes the "A" reactor recirculation pump discharge valve to close to the 88% open position. Assume a normal valve lineup.

Which one of the following is the automatic response of the reactor recirculation system?

- a. The "A" pump trips.
- b. Scoop tube lockup occurs on both pumps.
- c. Scoop tube lockup on the "A" pump.
- d. The "A" pump speed runs back to 28% of maximum.

QUESTION: 019 (1.00)

Which one of the following RHR pump combinations will lose its power supply if a fault occurs on 4160 Vital Bus E3?

- a. 1A/2A
- b. 1B/2B
- c. 1C/2C
- d. 1D/2D

QUESTION: 020 (1.00)

The LPCI valves listed below have time interlocks, which do not allow them to be closed or throttled following a LPCI initiation signal.

- LPCI Outboard injection Valve, FO17A(B)
- Inboard Injection Valve, FO15A(B)
- RHR Heat Exchanger Bypass Valve, FO48A(B)

Which one of the following describes the time interlocks associated with these valves?

- a. FO17A(B) 3 minutes
FO15A(B) duration of LPCI initiation signal
FO48A(B) 5 minutes
- b. FO17A(B) 5 minutes
FO15A(B) 5 minutes
FO48A(B) 3 minutes
- c. FO17A(B) 3 minutes
FO15A(B) 10 minutes
FO48A(B) 5 minutes
- d. FO17A(B) 5 minutes
FO15A(B) duration of LPCI initiation signal
FO48A(B) 3 minutes

QUESTION: 021 (1.00)

The following conditions exist for Unit 1:

- Reactor water level +110 inches
- Drywell pressure +2.0 psig
- Reactor pressure 100 psig
- Alarm "HPCI VAC BRKR VLV F075/F079 NOT FULL OPEN"
- Alarm "HPCI TURB TRIP"
- Alarm "HPCI TRIP SOL ENER"

Which one of the following is the response of HPCI, if reactor pressure increases to greater than 120 psig and HPCI injection is required?

HPCI low pressure isolation:

- a. must be manually reset before HPCI will automatically inject.
- b. will automatically reset and HPCI will inject.
- c. must be manually reset and the injection valve must be manually opened.
- d. will automatically reset but Group 4 steam supply valves must be manually opened before HPCI will automatically inject.

QUESTION: 022 (1.00)

Which one of the following describes how injection from HPCI is terminated and prevented if HPCI is not operating during an ATWS event?

- a. Depress the HPCI manual isolation pushbutton.
- b. Close the HPCI Injection Valve, E41-F006.
- c. Depress and hold the HPCI turbine trip pushbutton.
- d. Place the HPCI auxiliary oil pump in "Pull-To-Lock."

QUESTION: 023 (1.00)

When operating HPCI for level or pressure control in accordance with the EOPs, the operator is directed to defeat the HPCI high suppression pool (SP) level suction transfer in accordance with EOP-01-SEP-10, "Circuit Alteration Procedure."

Which one of the following describes the affect this has on the HPCI suction valve logic?

The HPCI suction valves:

- a. can not be transferred manually or automatically on a CST low level signal or SP high level signal.
- b. can only be transferred manually if a CST low level signal and a SP high level signal exist.
- c. will automatically transfer if a CST low level signal exists.
- d. will automatically transfer if a SP high level signal exists.

QUESTION: 024 (1.00)

Which one of the following is the purpose of the "white" indicating light, E21-DS20B/A, associated with each core spray pump?

The white light indicates that the:

- a. pumps associated 4160 VAC breaker is closed with control power available.
- b. pump was manually stopped while an initiation signal was still present.
- c. pumps associated 4160 VAC breaker was locally closed with emergency diesel generator power being supplied.
- d. pump has tripped on a fault with a valid initiation signal present.

QUESTION: 025 (1.00)

Which one of the following is the power supply to Core Spray Pump, 1B?

Core Spray Pump, 1B is powered from 4160V Emergency Bus:

- a. E1.
- b. E2.
- c. E3.
- d. E4.

QUESTION: 026 (1.00)

Given the following conditions on Unit 2:

- An ATWS has occurred
- Rods are being driven in using RMCS per LEP-02
- Stand by liquid control (SLC) Pump 2A is OUT-OF-SERVICE
- Reactor vessel water level is being maintained at TAF
- Reactor power is 5%.
- SLC Pump 2B is injecting
- HPCI is being used for vessel level control

There is a subsequent Loss of Off-Site Power and only DG3 starts and loads onto its respective emergency bus.

What action should be taken to continue boron injection?

- a. Inject boron with HPCI.
- b. Inject boron with RCIC.
- c. Inject boron with CRD Pump 2A.
- d. Inject boron with RWCU Pump 2A.

QUESTION: 027 (1.00)

The following conditions exist for Unit 2:

- The reactor has scrammed and the mode switch is in SHUTDOWN
- The problem has been identified and corrected
- Alarm "SDV HI HI LEVEL RPS TRIP" is actuated

The operator places the scram discharge volume high level scram keylock switch to BYPASS, turns the scram reset switch to both directions and then places the mode switch to STARTUP.

Which one of the following describes the expected reactor protection system response?

- a. No system response for the present plant conditions.
- b. The reactor scram will reset and remain reset.
- c. The reactor scram will reset and again scram.
- d. The reactor scram will reset when the scram discharge volume drains.

QUESTION: 028 (1.00)

Which one of the following describes the status of the RPS components, IMMEDIATELY following an inadvertent manual actuation of alternate rod insertion (ARI)?

- | | |
|----------------------------------|--------------|
| a. Scram Pilot Solenoid Valves - | De-energized |
| Backup Scram Valves - | Open |
| ARI Solenoid Valves - | De-energized |
| b. Scram Pilot Solenoid Valves - | Energized |
| Backup Scram Valves - | Closed |
| ARI Solenoid Valves - | De-energized |
| c. Scram Pilot Solenoid Valves - | De-energized |
| Backup Scram Valves - | Open |
| ARI Solenoid Valves - | Energized |
| d. Scram Pilot Solenoid Valves - | Energized |
| Backup Scram Valves - | Closed |
| ARI Solenoid Valves - | Energized |

QUESTION: 029 (1.00)

A reactor startup is in progress with IRMs on Range 2. While withdrawing SRM detectors, the operator inadvertently selects IRM detector E drive unit.

Which one of the following describes the effect this has on the IRM system?

- a. IRM E detector will NOT withdraw because companion APRM E is downscale.
- b. IRM E detector will withdraw and "IRM A UPSCALE/INOP" annunciator will be received.
- c. IRM E will withdraw and a control rod block will be generated when the detector begins to withdraw.
- d. No action occurs because the range selector switch for IRM E is on Range 2 and the mode switch is not in "RUN."

QUESTION: 030 (1.00)

Given the following plant conditions:

- Reactor startup is in progress
- Range switches for IRM's A, C, E, are on Range 3
- IRM G is bypassed.

Which one of the following describes the status of the SRM division "A" rod blocks?

- a. No SRM division "A" rod blocks are bypassed.
- b. Only the SRM downscale is bypassed.
- c. Both SRM INOP and downscale are bypassed.
- d. Both SRM downscale and detector not full in are bypassed.

QUESTION: 031 (1.00)

During a reactor startup the SRM system loses monitoring capability and a rod block is received.

Which one of the following power sources has been lost?

- a. 24 Volt DC
- b. 120 VAC Emergency Power
- c. RPS Power System
- d. 120 VAC UPS

QUESTION: 032 (1.00)

Which one of the following is the maximum number of LPRMs that can have their function switch out of OPERATE for APRM channel "D," without generating a "APRM UPSCL TRIP/INOP SYS B" annunciator?

- a. 3
- b. 4
- c. 6
- d. 7

QUESTION: 033 (1.00)

With Unit 1 operating at 100% power, APRM channel "C" has the following LPRMS bypassed:

04-37B 36-05B 12-29C 04-21D 28-29A

With these conditions LPRM 20-05D fails downscale.

Which one of the following is required, assuming no other APRMs are inoperable? [(A listing of LPRM detectors included in APRM channels is available.)]

- a. No action is required, continue operation with no restrictions.
- b. Bypass LPRM 20-05D and continue operation with no restrictions.
- c. Bypass LPRM 20-05D and declare APRM channel "C" inoperable.
- d. Bypass LPRM 20-05D, declare APRM channel "C" inoperable and insert a trip on RPS channel "A."

QUESTION: 034 (1.00)

Which one of the following describes the function of the reference leg backfill system?

- a. Prevent flashing of the reference leg during rapid depressurization below 400 psig by providing cooling water to the reference leg.
- b. Ensure the reference leg remains full.
- c. Prevent erroneous low water level indication during a major steam leak.
- d. Prevent migration of non-condensable gases into the reference leg by increasing reference leg spillover.

QUESTION: 035 (1.00)

While restoring the RCIC system to standby status following an automatic initiation per OP-16, "RCIC System Operating Procedure," the operator inadvertently depresses the STEAM ISOLATION manual pushbutton instead of the TURBINE TRIP pushbutton.

Which one of the following describes the response of the RCIC Steam Supply Inboard Isolation Valve, E51-F007 and RCIC Steam Supply Outboard Isolation Valve, E51-F008?

- a. Only the Steam Supply Inboard Isolation Valve, E51-F007, closes.
- b. Only the Steam Supply Outboard Isolation Valve, E51-F008, closes.
- c. Both the Steam Supply Inboard Isolation Valve, E51-F007, and the Steam Supply Outboard Isolation Valve, E51-F008, close.
- d. NEITHER the Steam Supply Inboard Isolation Valve, E51-F007, or the Steam Supply Outboard Isolation Valve, E51-F008, close.

QUESTION: 036 (1.00)

Given the following plant conditions on Unit 2:

- A small break LOCA is in progress
- HPCI is inoperable
- Reactor vessel level TAF
- Reactor pressure 800 psig and lowering
- All low pressure ECCS pumps running
- Seven ADS valves opened on automatic initiation

A loss of off-site power occurs and all diesel generators tie onto their emergency buses to restore power.

Which one of the following describes the ADS valve response?

The ADS valves will:

- a. remain open.
- b. close then re-open as low pressure ECCS pumps sequence on.
- c. close then re-open 105 seconds after ECCS pumps sequence on.
- d. close and will not automatically re-open.

QUESTION: 037 (1.00)

Which one of the following describes the automatic alignment of the ADS pneumatic supply with a LOCA signal present?

The ADS pneumatic supply automatically aligns to the:

- a. pneumatic nitrogen system (PNS) backed up by reactor building noninterruptible air (RNA) system.
- b. PNS backed up by backup nitrogen system.
- c. backup nitrogen system.
- d. RNA system.

QUESTION: 038 (1.00)

Given the following reactor vessel level inputs to the digital feedwater control system (DFCS):

- LT-N004A 183 inches
- LT-N004B 190 inches
- LT-N004C 188 inches
- Level select switch on P-603 selected to "A"

Which one of the following will be the selected level input of the DFCS?

- a. 183 inches
- b. 187 inches
- c. 188 inches
- d. 190 inches

QUESTION: 039 (1.00)

Which one of the following will automatically remove the "3 element permissive" from the digital feedwater control system?

- a. Reactor vessel level instrument out of tolerance
- b. Reactor feed pump control signal failure
- c. Steam flow and feed flow decrease to less than 20% of total.
- d. Reactor Scram

QUESTION: 040 (1.00)

During operation at 100% power, RPS Motor Generator Set "A" trips.

Which one of the following describes the affect this has on the Standby Gas Treatment (SBGT) system?

- a. SBGT train "A" must be declared inoperable.
- b. Only the SBGT train selected with the "SBGT A(B) PREF" control switch on RTGB XU-51 will start.
- c. Neither SBGT train will automatically start.
- d. Both SBGT trains will automatically start.

QUESTION: 041 (1.00)

Diesel Generator (DG) 3 tripped on high lube oil temperature while operating in LOCAL MANUAL. With DG3 in this condition, the master/slave breaker from 2D to E3 trips open.

Which one of the following describes the expected response of DG3?

DG3 will:

- a. start and energize bus E3.
- b. start and trip after 45 seconds.
- c. not start due to local manual status.
- d. not start until the lockout is manually reset.

QUESTION: 042 (1.00)

Following a scram from 100% power the ball check valve in the insert port for one control rod drive mechanism malfunctions, and fails to unseat and shift position.

Which one of the following is the effect on that control rod's ability to scram?

The control rod will:

- a. not insert until reactor and CRD pressures equalize.
- b. hydraulically lock-up and remain stationary.
- c. will fully insert at slower than normal speed.
- d. will fully insert at higher than normal speed.

QUESTION: 043 (1.00)

Reactor power is 30%. Rod 06-23 from step 19 is selected for insertion to position 00 in accordance with GP-10. The RWM annunciator alarms with the following RWM OD screen:

| | | |
|-------------------------|-------------------|-------------------|
| SELF-TEST: FAULT | SEQUENCE: A2 BPWS | MODE: OPERATE |
| BLOCKS: INSERT WITHDRAW | STEP: 19 | POWER: BELOW LPAP |
| SR 06 - 23 : 08 | | IB WB |
| A2 - 19 | | |
| HELP | DISPLAY OFF | ETC |

Which one of the following describe why insert and withdraw blocks have occurred?

- a. The selected rod is a select error.
- b. The selected rod has invalid rod position data.
- c. The RWM has detected a position error.
- d. The self test has detected a critical failure.

QUESTION: 044 (1.00)

A plant shutdown is in progress. The last control rod from step 6B has been inserted and another control rod has been selected.

The RWM display indicates:

| | | |
|------------------|----------------------|------------------|
| SELF TEST:OK | SEQUENCE: B2X BPWS 3 | MODE:OPERATE |
| BLOCKS: INSERT | STEP: 6B | POWER:BELOW LPSP |
| WITHDRAW | | |
| SR 30 -- 07 : 00 | | SE IB WB |
| IE 06 -- 39 : 14 | | B2X--6B |
| HELP | DISPLAY OFF | ETC |

What action should be taken to clear ALL existing RWM blocks?

- Select any control rod from Rod Sequence Checkoff Sheet, step 6B.
- Select any control rod from Rod Sequence Checkoff Sheet, step 6A.
- Select and withdraw control rod 06-39 to position 16.
- Withdraw control rod 30-07 to position 04.

QUESTION: 045 (1.00)

When measuring total core flow, the individual recirculation loop flows are summed when both loops are in service.

Which one of the following describes the method by which the circuitry determines if both loops are in service.

The flow circuitry:

- a. looks at the status of the recirculation pump breakers and the pump discharge isolation valves.
- b. monitors for a minimum value of "forward" flow in each of the loops.
- c. looks at the status of the recirculation pump breakers and the pump suction isolation valves.
- d. monitors for minimum speed (28% limiter) operation of each of the recirculation pumps.

QUESTION: 046 (1.00)

Which one of the following describes how the recirculation jet pump design provides core reflood capability?

- a. All ECCS flow entering the core must flow through the jet pumps.
- b. The height of the jet pump throat inlets are at 2/3 active core height.
- c. All flow leaving the active core area during a design basis accident must flow through the jet pumps.
- d. Leakage at the jet pump mixer/diffuser joint is less than the capacity of two LPCI pumps.

QUESTION: 047 (1.00)

Which one of the following describes the direct effect initiation of standby liquid control (SLC) has on the reactor water cleanup (RWCU) system.

Initiation of SLC will:

- a. trip the RWCU pumps.
- b. initiate a full Group 3 PCIS isolation.
- c. bypass the filter demineralizers.
- d. close the Outboard RWCU Isolation Valve, F004.

QUESTION: 048 (1.00)

RHR loop "A" is in shutdown cooling maintaining a 45 degrees F/hr cooldown rate.

Conditions are:

- Recirculation loop temperature 298 degrees F
- RHR HX outlet temperature 205 degrees F
- RHR total flow rate 4150 gpm
- RHR HX service water (SW) outlet temperature 168 degrees F and slowly rising
- RHR HX service water flow 3800 gpm
- Both RHR Service Water Booster pumps are operating

Which one of the following describes the required action for the above conditions? [20P-17 section 5.4, Shutdown Cooling Mode is available.]

- a. Throttle open RHR SW Outlet Valve, E11-PDV-F068A.
- b. Throttle closed RHR HX 2A Bypass Valve, E11-F048A.
- c. Throttle closed RHR HX 2A Outlet Valve, E11-F003A.
- d. Throttle open LPCI Outboard Injection Valve, E11-F017A.

QUESTION: 049 (1.00)

During operation at 100% control rod 26-15 drifts in to the "full in" position due to a leaking scram inlet valve.

Which one of the following will be the control rod position indication?

- a. Green "full in" light and no indication on the 4-rod display.
- b. Green "full in" light and "00" on the 4-rod display.
- c. NO Green "full in" and "00" on the 4-rod display.
- d. NO Green "full in" and no indication on the 4-rod display.

QUESTION: 050 (1.00)

Given the following conditions:

- Unit 2 is at 40% power
- APRM "D" fails "Downscale"
- NO operator actions have been taken

Which one of the following describes the automatic response of the Rod Block Monitor (RBM) system? (Consider only the effect of the RBM system.)

RBM channel "B":

- a. enforces the high trip setpoint (HTSP).
- b. automatically shifts to APRM "F".
- c. sends a rod withdrawal block to RMCS.
- d. rod block logic is bypassed.

QUESTION: 051 (1.00)

Control rod 30-31 is selected for movement when all "D" level LPRMs associated with the rod fail downscale.

Which one of the following describes the effect the RBM will have on any subsequent rod motion?

The RBM will:

- a. allow inward motion only.
- b. allow outward motion only.
- c. block both inward and outward motion.
- d. allow both inward and outward motion.

QUESTION: 052 (1.00)

A LOCA signal on Unit 1 has resulted in an automatic closure signal to the Containment Spray Valves FO16A/B and FO21A/B.

Which one of the following conditions will allow manual opening of these valves, with the LOCA signal still present?

- a. Drywell pressure less than 2.7 psig.
- b. Containment spray valve control (THINK) switch in MANUAL with drywell pressure above 2.7 psig.
- c. 2/3 core height manual override keylock switch in OVERRIDE with drywell pressure above 2.7 psig.
- d. As soon as LPCI refloods the reactor vessel above 2/3 core height regardless of drywell pressure.

QUESTION: 053 (1.00)

Which one of the following are the suppression chamber pressures, at which the initiation and termination of suppression pool sprays is required?

INITIATION

- a. After Exceeding 13 psig
- b. After Exceeding 13 psig
- c. Before Exceeding 13 psig
- d. Before Exceeding 13 psig

TERMINATION

- Before Decreasing Below 2.5 psig
- Before Decreasing Below 2.7 psig
- After Decreasing Below 2.7 psig
- After Decreasing Below 2.5 psig

QUESTION: 054 (1.00)

Both units are at rated power when the following Unit 1 Pneumatic Nitrogen System (PNS) alarms are received:

- PNS SYS DIV I HDR PRESS LO
- PNS SYS DIV I HDR PRESS LO-LO
- PNS SYS DIV II HDR PRESS LO
- PNS SYS DIV II HDR PRESS LO-LO
- PNS SYS N2 STOR TANK PRESS LO

Which one of the following describes the effect on the inboard main steam isolation valves (MSIVs)?

The MSIVs:

- a. remain open due to automatic alignment of noninterruptible air to the drywell on low PNS pressure.
- b. fail closed as pneumatic pressure depletes sufficiently to reposition MSIV pilot control valves.
- c. immediately close due to de-energization of MSIV solenoids on low pneumatic supply pressure.
- d. remain open due to automatic alignment of backup nitrogen supply to drywell on low PNS pressure.

QUESTION: 055 (1.00)

Which one of the following are the power supplies to the two solenoids associated with each main steam isolation valve (MSIV)?

| INBOARD MSIVs ----- | OUTBOARD MSIVs ----- |
|-------------------------------|----------------------------|
| a. 125 VDC "A" RPS "A" | 125 VDC "B" RPS "B" |
| b. 125 VDC "B" RPS "B" | 125 VDC "A" RPS "A" |
| c. 125 VDC "A" 125 VDC "B" | RPS "A" RPS "B" |
| d. RPS "A" RPS "B" | 125 VDC "A" 125 VDC "B" |

QUESTION: 056 (1.00)

During operation at 100% power a sudden complete loss of EHC occurs.

Which one of the following is the expected response of the turbine and associated support systems?

- a. Turbine stop and control valves fail closed on low EHC pressure, turbine control valve fast closure actuates RPS trip, bypass valves function for approximately 60 seconds then fail closed.
- b. Turbine trip on overspeed, turbine stop valves < 90% open actuates RPS trip, bypass valves fail closed.
- c. Turbine trip on low EHC pressure, turbine stop valves < 90% open actuates RPS trip, bypass valves function for approximately 60 seconds then fail closed.
- d. Turbine trip on low EHC pressure, turbine stop valves < 90% open actuates RPS trip, bypass valves fail closed.

QUESTION: 057 (1.00)

Which one of the following is the normal suction source for the control rod drive pumps during operation at 100% power?

- a. Main condenser hotwell.
- b. Discharge of condensate pumps prior to the steam packing exhauster.
- c. Direct from condensate storage tank (CST).
- d. Hotwell reject to CST line.

QUESTION: 058 (1.00)

A Unit 2 4160V AC breaker has been racked in following maintenance on its associated pump. The operator racking in the breaker installed the control power fuses but failed to position the breaker toggle switch to the "ON" position.

Which one of the following is the affect on breaker operability?

The breaker will have:

- a. normal control room indications but no remote operation will be possible.
- b. normal control room indications but can be only be closed by local pushbutton.
- c. no control room indications and cannot be operated by the remote controls.
- d. no control room indications but may be closed with the local pushbutton.

QUESTION: 059 (1.00)

During operation at 100% power, Augmented Off-Gas (AOG) system annunciator, APP UA-39 2-2, DISCHARGE H2 CONC HIGH is received.

Which one of the following is the first automatic action that results from this condition.

- a. Isolation and bypass of the AOG system after a 30 second time delay.
- b. Immediate actuation of the AOG process timer.
- c. AOG Bypass Valve, HCV-102 and Filter House Loop Seal Reservoir Drain Valve, SV-4907 close after a 15 minute time delay.
- d. Recombiner strip heaters immediately energize.

QUESTION: 060 (1.00)

During operation at 100% power, a valid main steam line radiation signal greater than three times full power background is received on channels "A", "B", and "C."

Which one of the following statements describes ALL of the protective actions which result?

- a. Reactor scrams from main steam line radiation signal, full Group 1 isolation and isolation of the condenser mechanical vacuum pump.
- b. Reactor scrams from MSIV position signal, Group 1 isolation, isolation of the main steam line drains and isolation of the condenser mechanical vacuum pump.
- c. Half scram RPS channel "A" and PCIS channel "A" Group 1 isolation signal.
- d. Reactor scram from main steam line radiation signal, Group 1 isolation and isolation of recirculation sample valves.

QUESTION: 061 (1.00)

Which one of the following systems injects inside the reactor vessel shroud?

- a. Reactor Water Cleanup Return
- b. Standby Liquid Control
- c. Reactor Feedwater
- d. Low Pressure Coolant Injection

QUESTION: 062 (1.00)

The Control Room Operator records the following integrator data, four hours after the previous data was taken:

- Drywell floor drain sump; gallons pumped since last reading
= 384 gallons
- Drywell equipment drain sump; gallons pumped since last reading
= 1176 gallons

Which one of the following is the reactor coolant system unidentified leakage rate?

- a. 1.6 gpm.
- b. 3.3 gpm.
- c. 4.9 gpm.
- d. 6.5 gpm.

QUESTION: 063 (1.00)

Given the following conditions on Unit 2:

- Reactor mode switch is in "REFUEL"
- Control rod 22-31 is withdrawn for testing
- Rod select power switch is in the "ON" position

Which one of the following will generate a rod block with these conditions?

A rod out block will result if the:

- a. operator turns the rod select power switch to "OFF" then "ON" and selects rod 30-31.
- b. refueling bridge is over the core.
- c. rod select pushbutton for control rod 38-31 is depressed.
- d. refueling bridge console is deenergized.

QUESTION: 064 (1.00)

Unit 1 is in the process of off loading the core when the Unit 1 fuel pool cooling pump fails.

Which one of the following systems can be aligned to cool the Unit 1 fuel pool?

- a. Supplemental spent fuel pool cooling system
- b. RHR "A" loop
- c. RHR "B" loop
- d. Unit 2 fuel pool cooling system

QUESTION: 065 (1.00)

Which one of the following describes why EOP-01, "Level Power Control" directs the operator to inhibit ADS?

Inhibiting ADS:

- a. prevents discharging boron to the suppression pool via the SRVs.
- b. ensures RPV pressure remains high enough to scram control rods.
- c. ensures adequate natural circulation is retained for boron mixing.
- d. prevents the power excursion from an uncontrolled coolant injection.

QUESTION: 066 (1.00)

During a Unit 2 startup, a loss of extraction steam resulted in the following conditions:

- Reactor power 60%
- Core flow 30 mlbs/hr
- Core plate d/p 6.0 psid
- Generator output 425 MWe

Which one of the following is the required action? [Figure 1, Thermal Power Limitations is available.]

- a. Initiate Select Rod Insert
- b. Manually scram the reactor
- c. Raise core flow above 35 mlbs/hr
- d. Commence a normal reactor shutdown

QUESTION: 067 (1.00)

A Loss Of Coolant Accident (LOCA) concurrent with a Loss Of Off Site Power and failure of DG 4 to start occurred on Unit 2 at 3:00 pm. At 3:08 pm the Shift supervisor directed the operator to place the Bus E2 to Bus E4 crosstie breaker control switch in "MAINT."

Which one of the following describes the operation of the Bus E2 to Bus E4 crosstie breakers with these conditions?

The Bus E2 to Bus E4 crosstie breakers may:

- a. be closed ten minutes after the LOCA signal (3:10 pm).
- b. be closed ten minutes after the control switch is placed in "MAINT" (3:18 pm).
- c. not be closed unless the control switch is placed in either the "SBO" or "Fire" positions.
- d. not be closed in accordance with current plant procedures.

QUESTION: 068 (1.00)

Which one of the following would be an indication of a loss of 4160V Bus, E2?

- a. Partial Group 2, 6, and 8 isolations.
- b. Partial Group 1, 2, 3, 6, 8, and 10 isolations.
- c. Two diesel generators start.
- d. Automatic start of DC lube oil pumps.

QUESTION: 069 (1.00)

Following a reactor scram on Unit 2 the operator can NOT determine that reactor power is less than 3%.

Which one of the following immediate operator actions for a reactor scram is ONLY performed on Unit 2?

- a. VERIFY or PLACE the Feedwater/Level Controller setpoint to +170 inches.
- b. WHEN reactor power is below the APRM downscale setpoint, TRIP the Main Turbine.
- c. When steam flow is less than 3 million lb/hr, PLACE the Reactor MODE Switch to SHUTDOWN.
- d. WHEN Reactor Vessel level is above + 170 inches AND increasing, IF two Reactor Feed Pumps are running, THEN trip one.

QUESTION: 070 (1.00)

During a transient, RPV pressure increased to 1110 psig and started to fall due to the opening of SRVs. RPV level has remained in the normal operating range and no operator action has been taken.

Which one of the following is the number of SRVs which have automatically opened?

- a. Two
- b. Three
- c. Four
- d. Five

QUESTION: 071 (1.00)

Which one of the following is a direct result of excessive steam carryunder?

Excessive steam carryunder will:

- a. decrease the amount of feedwater preheating.
- b. increase moisture carryover.
- c. decrease the margin to the MCFR core thermal limit.
- d. decrease the turbine efficiency.

QUESTION: 072 (1.00)

Which one of the following is the purpose of the 45% demand, recirculation flow control speed limiter #2?

Speed limiter #2:

- a. prevents running the recirculation pump at high speed with the discharge valve only partially open.
- b. provides NPSH protection for the recirculation jet pumps at low feedwater flow.
- c. limits reactor power so that the feedwater system will be able to maintain or recover reactor water level on loss of a reactor feed pump.
- d. limits recirculation flow such that possible operation in the areas of instability is reduced.

QUESTION: 073 (1.00)

During operation at 100% power a gross failure of both seals on recirculation pump "B" occurs.

Which one of the following is the amount and type of drywell leakage?

- a. 55-65 gpm of Unidentified leakage
- b. 55-65 gpm of Identified leakage
- c. 110-130 gpm of Unidentified leakage
- d. 110-130 gpm of Identified leakage

QUESTION: 074 (1.00)

When controlling primary containment pressure below 1.8 psig, EOP-02 "Primary Containment Control Procedure," directs the operator to "VENT THE DRYWELL USING SBT (OP-10) AS REQUIRED."

Which one of the following describes the vent flowpath specified in OP-10?

- a. Suppression chamber via the 2 inch line utilizing the 1/2 inch post LOCA inlets to SBT.
- b. Suppression chamber via the 20 inch line utilizing the normal inlet (F) damper to SBT.
- c. Drywell via the 18 inch line utilizing the normal inlet (F) damper to SBT.
- d. Drywell through the 2 inch bypass line and suppression chamber through the 2 inch line, utilizing the normal inlet (F) damper to SBT.

QUESTION: 075 (1.00)

Unit 1 is operating at 75% power with the following conditions:

- Suppression pool water temperature is 85 degrees F with one loop of suppression pool cooling in service
- Safety relief valve (SRV) operability surveillance is in progress
- Following operation of SRV "L," there is indication that it is stuck open

Which one of the following criteria requires the operator to manually scram the reactor.

- a. Suppression pool temperature continues to increase with all available cooling in service.
- b. As soon as it is recognized the SRV will not close.
- c. The safety relief valve has been open for 2 minutes.
- d. Suppression pool average water temperature increases to 105 degrees F.

QUESTION: 076 (1.00)

Which one of the following initial plant conditions would result in the worst case, rod drop accident?

- a. Between 10% and 25% reactor power.
- b. Between 29% and 64% reactor power.
- c. Between 50% rod density and 10% reactor power.
- d. Less than 50% rod density.

QUESTION: 077 (1.00)

Following an incomplete reactor scram the Shift Supervisor has entered EOP-01-LEP-02, "Alternate Control Rod Insertion" to insert rods.

Which one of the following alternate rod insertion methods require a reset of the reactor protection system?

Control rod insertion by:

- a. de-energizing the scram pilot valve solenoids.
- b. venting the scram air header.
- c. using the reactor manual control system.
- d. increasing cooling water header pressure.

QUESTION: 078 (1.00)

AOP-32.0, "Plant Shutdown From Outside Control Room," cautions the operator to minimize throttling actions on DC motor-operated valves.

Which one of the following describes the reason for this caution?

Throttling actions on DC motor-operated valves should be minimized to:

- a. prevent exceeding the duty cycle on the motors.
- b. prevent excessive drain on the vital batteries.
- c. limit valve wear from throttling actions.
- d. limit electrical arcing in an explosive gas atmosphere, which may be present.

QUESTION: 079 (1.00)

Given the following plant conditions:

- Reactor has been shutdown for 24 hours
- Control rod 13-12 indicates notch "00" but does not indicate a full in, green light
- SRMs A and C are reading 2 cps
- SRMs B and D are reading 5 and 8 counts respectively
- Fuel pool level is 23 feet 2 inches above the fuel assemblies seated in the spent fuel storage rack

With the above conditions which one of the following would prevent removal of spent fuel from the reactor core, either procedurally or because of a refueling interlock?

- a. The level of water above the fuel assemblies when seated in the spent fuel storage rack is not high enough.
- b. The required number of SRM channels are not available per Technical Specifications.
- c. The failure of rod 13-12 to generate a rod full in signal to RMCS.
- d. The required time before spent fuel can be removed from the reactor core has not elapsed.

QUESTION: 080 (1.00)

Given the following plant conditions on Unit 2:

- Refueling operations are in progress
- A spent fuel bundle is dropped and damaged
- AREA RAD REFUEL FLOOR HIGH annunciator is alarming

Which one of the following is a required immediate operator action?

- a. Start the standby gas treatment system.
- b. Order evacuation of the Reactor Building.
- c. Isolate Reactor Building ventilation.
- d. Order all fuel movement stopped.

QUESTION: 081 (1.00)

EOP-01-SEP-01, "Primary Containment Venting," directs venting of primary containment via the suppression chamber, if drywell pressure cannot be maintained below 70 psig, or hydrogen concentration reaches 1%.

Which one of the following is the reason that this path is the preferred method to vent the primary containment under these conditions?

Venting from the suppression chamber:

- a. condenses any steam from the primary containment.
- b. prevents excessive drywell-to-torus differential pressure.
- c. utilizes the scrubbing action of the torus to remove iodine.
- d. dilutes the explosive hydrogen concentration.

QUESTION: 082 (1.00)

At the end of a Unit 2 operating cycle with the plant in coastdown and all rods out, a transient results in a peak reactor pressure of 1130 psig for 5 seconds.

Which one of the following describes the affect the ATWS-RPT will have on the reactor recirculation pumps?

The ATWS-RPT will:

- a. not actuate unless RPV LL No. 2 is present at the same time.
- b. actuate and trip the recirculation MG set drive motor breaker.
- c. actuate and trip the recirculation MG set field breaker
- d. actuate and trip the two breakers installed in series between the generator and the recirculation pump motor.

QUESTION: 083 (1.00)

During operation at 80% power on Unit 2, the "A" Reactor Recirculation Pump trips.

The following plant conditions exist following the pump trip:

- The reactor is in region B on the thermal power limitations map
- Multiple LPRM upscale/downscale alarms are periodically annunciating and clearing
- APRM power oscillations are 6% peak to peak on two channels and 7% on four channels

Which one of the following is an immediate operator action with these conditions?

- a. Increase core flow to greater than 35 mlbs/hr using the "B" reactor recirculation pump.
- b. Decrease core flow to less than 35 mlbs/hr using the "B" reactor recirculation pump.
- c. Reduce reactor power to a level compatible with core flow by inserting control rods.
- d. Insert a manual reactor scram.

QUESTION: 084 (1.00)

Which one of the following is an indication of a jet pump failure during operation at 100% power?

- a. Decrease in indicated total core flow.
- b. Core plate differential pressure decrease.
- c. Recirculation loop flow decrease in the loop with the failed jet pump.
- d. Recirculation pump discharge pressure increase on the loop with the failed jet pump.

QUESTION: 085 (1.00)

Following a loss of main condenser vacuum the bypass valves are being used to lower reactor pressure.

Which one of the following vacuum readings corresponds to the lowest value at which the bypass valves will still be effective in reducing reactor pressure? (Consider ONLY actual plant setpoints per AOP-37.0 for your answer)

- a. 19 inches Hg
- b. 10 inches Hg
- c. 7 inches Hg
- d. 0 inches Hg

QUESTION: 086 (1.00)

Which one of the following describes the function of the low condenser vacuum bypass switches?

- a. Bypass the low vacuum turbine trip while reducing generator output following loss of a circulating water pump.
- b. Bypass the bypass valve low vacuum closure, during ATWS conditions.
- c. Allow operation of the mechanical vacuum pump during a loss of condenser vacuum transient.
- d. Allow operation of the steam seals when establishing initial condenser vacuum using the mechanical vacuum pump.

QUESTION: 087 (1.00)

Which one of the following describes the operational impact a loss of 125V DC control power has on a 4160V AC breaker?

A 4160V AC breaker that has lost control power will:

- a. not trip on a fault and can not be tripped from the control room.
- b. not trip on a fault but can be tripped from the control room.
- c. trip on a fault but can not be tripped from the control room.
- d. trip on a fault and can be tripped from the control room.

QUESTION: 088 (1.00)

Given the following plant conditions:

- Reactor has scrammed
- RCIC is operating maintaining vessel level
- HPCI was secured by the operator

Which one of the following describes the affect a loss of Division I, 125V DC will have on RCIC?

Following a loss of Division I 125V DC, the RCIC:

- a. Turbine Steam Supply Valve, (E51-F045) will not close on a high vessel level condition.
- b. turbine will trip on overspeed.
- c. turbine speed will decrease to approximately 2000 RPM.
- d. system inboard isolation logic will actuate.

QUESTION: 089 (1.00)

Which one of the following describes why EOP-01-RSP, "Reactor Scram Procedure," directs the operator to "TRIP TURBINE" instead of letting it trip automatically on reverse power?

The automatic reverse power trip:

- a. will result in excessive arcing in the main generator output breakers.
- b. may cause a pressure spike sufficient to rupture the LP turbine relief diaphragms.
- c. will result in an automatic cold start of the diesel generators.
- d. may place an unnecessary load on the main turbine thrust bearing.

QUESTION: 090 (1.00)

Which one of the following limits the rate at which reactor vessel level can be lowered using reactor water cleanup reject at rated temperature and pressure.

- a. Regenerative heat exchanger cooldown rate.
- b. Nonregenerative heat exchanger outlet temperature.
- c. Temperature change limit in the reactor vessel drain line.
- d. Pressure downstream of reject Flow Control Valve, G33-F033.

QUESTION: 091 (1.00)

Which one of the following is one of the basis for the DRYWELL SPRAY INITIATION LIMIT?

Initiation of drywell sprays while in the "SAFE" area of the DRYWELL SPRAY INITIATION LIMIT prevents:

- a. excessive cycling of the primary containment vacuum breakers.
- b. de-inertion of the containment.
- c. chugging in the SRV tailpipes.
- d. drawing suppression pool water up the SRV tail pipes.

QUESTION: 092 (1.00)

Which one of the following cooling water system conditions requires a manual reactor scram if pressure cannot be immediately restored?

- a. Conventional Service Water pressure is steady at 36 psig with one TBCCW Service Water Supply Valve (SW-V4) in its throttled position.
- b. Nuclear Service Water pressure is 25 psig and decreasing and Diesel Generator Building service water header was left isolated.
- c. All Turbine Building Closed Cooling Water system pumps are running and pressure is 45 psig.
- d. All Reactor Building Closed Cooling Water system pumps are running and pressure is 65 psig and decreasing.

QUESTION: 093 (1.00)

Given the following plant conditions:

- A loss of off-site power has occurred
- RBCCW PUMP DISCH HDR PRESS LOW annunciator is alarming
- Discharge header pressure indicates 30 psig

Which one of the following describes the automatic restart feature(s) of the RBCCW pumps as the diesel generators energize the E buses.

The RBCCW pumps will:

- a. start only if their control switch is in AUTO.
- b. start only if their control switch is in ON.
- c. start if their control switch is in AUTO or ON.
- d. not restart unless their control switch is placed to OFF then to AUTO or ON.

QUESTION: 094 (2.00)

Match the pneumatic (air/nitrogen) system failure automatic actions from Column A with the actuation pressure listed in Column B.

The items from column B may be used once, more than once, or not at all and only a single answer may occupy one answer space.

| COLUMN A AUTOMATIC ACTIONS ----- | COLUMN B ACTUATION PRESSURE ----- |
|---|---|
| a. Air Compressors A, B and C start | 1. 85 psig |
| b. Service Air Isolation Valves, PV-706-1 and PV-706-2 close | 2. 95 psig |
| c. Standby Reactor Building Air Compressors start | 3. 100 psig |
| d. Backup Nitrogen Rack Isolation Valves, RNA-SV-5481 and RNA-SV-5482 open | 4. 105 psig |
| | 5. 107 psig |
| | 6. 109 psig |
| | 7. 110.5 psig |

QUESTION: 095 (1.00)

Which one of the following pairs of Group 1 isolation signals will cause the Recirculation Sample Valves, B32-F019 and B32-F020 to close?

- a. Reactor Low Level #3, Main Steam Line High Flow
- b. Condenser Vacuum, Main Steam Line Low Pressure
- c. Turbine Building Area Temperature High, Main Steam Line Tunnel Temperature High
- d. Reactor Low Level #3, Main Steam Line High Radiation

QUESTION: 096 (1.00)

During a plant startup and heatup a loss of both CRD pumps occurs.

Which one of the following is the MINIMUM reactor pressure allowed before a manual reactor scram is required?

- a. 700 psig
- b. 750 psig
- c. 800 psig
- d. 850 psig

QUESTION: 097 (1.00)

Unit 2 was operating at 100% power when a LOCA occurred.

The following plant conditions exist:

- Drywell reference leg area temperature is 375 degrees F
- Drywell pressure is 5 psig
- Reactor pressure is 100 psig

Which one of the following reactor water level instruments would indicate a valid level? [Caution 1, Reactor Water Level is available]

- a. Fuel zone (N036/37) with a reading of greater than +150 inches
- b. Narrow range (N004A/B/C) with a reading of +152 inches
- c. Wide range (N026A/B) with a reading of +152 inches
- d. Shutdown range (N027A/B) with a reading of +152 inches

QUESTION: 098 (1.00)

The temperature control leg of EOP-03, "Secondary Containment Control Procedure" asks: "IS A PRIMARY SYSTEM DISCHARGING INTO THE REACTOR BUILDING?"

Which one of the following is a primary system as referenced in this step?

A Primary System is:

- a. any plant safety-related system required to be operable in Modes 1, 2 and/or 3.
- b. a system whose leak rate will decrease as reactor pressure decreases.
- c. a system required to shutdown the reactor or provide long-term core cooling.
- d. any plant system whose pressure will change with drywell and/or torus pressure.

QUESTION: 099 (1.00)

Regarding EOP-03-SCCP, "Secondary Containment Control Procedure."

Which one of the following is the significance of exceeding a Maximum Normal Operating Value?

- a. The "EQ" Envelope for operating equipment in the area will be exceeded.
- b. Personnel access necessary for safe shutdown of the plant will be prevented.
- c. Operating systems in the affected area will exceed the expected normal operating parameters.
- d. Equipment necessary for safe shutdown of the plant will fail.

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

MASTER COPY

ANSWER: 001 (1.00)

C.

REFERENCE:

OAP-010 Rev. 0 page 10 LOI-CLS-LP-201-C LO 06 Facility Exam Bank,
Record Sheet 4534

[4.2/4.2]

294001A102 ..(KA's)

ANSWER: 002 (1.00)

C.

REFERENCE:

AI-110 Rev. 5 page 4

[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 003 (1.00)

C.

REFERENCE:

OAI 58 page 17
Lesson Plan 1: LOI-CLS-LP-201-C

Objective: 01F

[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 004 (1.00)

a.

MASTER COPY

REFERENCE:

Plant Operating Manual Volume XXII OPLP-22 Rev. 2 page 6 (Book 33)

[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 005 (1.00)

a.

REFERENCE:

OOI-04 Rev. 53 Page 8

[3.3/4.3]

294001A111 ..(KA's)

ANSWER: 006 (1.00)

c.

REFERENCE:

OOI-05 Rev. 27 page 8

[4.5/4.3]

294001A113 ..(KA's)

ANSWER: 007 (1.00)

d.

REFERENCE:

OOI-13 Rev. 36 page 1

[3.7/3.7]

294001K101 ..(KA's)

ANSWER: 008 (1.00)

a.

REFERENCE:

OPS-CLS-SM-055A Rev. 0 page 8

[3.2/3.4]

294001A115 ..(KA's)

ANSWER: 009 (1.00)

d.

REFERENCE:

AOP-26.0 Rev.7 page 5

[2.9/3.4]

294001A114 ..(KA's)

ANSWER: 010 (1.00)

c.

REFERENCE:

10 CFR 20.1003 page 374

[2.8/3.4]

294001K103 ..(KA's)

ANSWER: 011 (1.00)

b.

REFERENCE:

10 CFR 20.1201 page 377

[3.3/3.8]

294001K103 ..(KA's)

ANSWER: 012 (1.00)

b.

REFERENCE:

10 CFR 26.20 (a)(1) page 482

[2.7/3.7]

294001A103 ..(KA's)

ANSWER: 013 (1.00)

a.

REFERENCE:

OOI-05 page 11

[4.5/4.3]

294001A113 ..(KA's)

ANSWER: 014 (1.00)

d.

REFERENCE:

SM-008-B Rev. 0 page 3 LO 6.a

[2.8/2.8]

201001A308 ..(KA's)

ANSWER: 015 (1.00)

b.

REFERENCE:

SM-008-B Rev. 0 page 7 LO 3.d

[2.8/2.8]

201001K110 ..(KA's)

ANSWER: 016 (1.00)

d.

REFERENCE:

SM-007- A pages 14 and 21 LO 10 d. OP-7 page 28

[3.2/3.1]

201002A301 ..(KA's)

ANSWER: 017 (1.00)

c.

REFERENCE:

APP A-06 5-1 page 60 SM-002-A LO 30 g.

[3.2/3.3]

202002K305 ..(KA's)

ANSWER: 018 (1.00)

d.

REFERENCE:

SM-002-A page 28 LO 17 d.

[3.0/3.0]

202002K402 ..(KA's)

ANSWER: 019 (1.00)

a.

REFERENCE:

SM-017-A page 4 LO 17 a.

[3.5/3.5]

203000K201 ..(KA's)

ANSWER: 020 (1.00)

d.

REFERENCE:

SM-017-A page 8 LO 10

[4.2/4.2]

203000K401 ..(KA's)

ANSWER: 021 (1.00)

d.

REFERENCE:

SM-019A page 32 LO 3 n. APP-011-1 pages 5, 41, and 62
[Recent Plant Modification]

[4.3/4.3]

206000K407 ..(KA's)

ANSWER: 022 (1.00)

d.

REFERENCE:

VI/0EOP-01-UG Rev. 20 page 23

[4.2/4.0]

206000G013 ..(KA's)

ANSWER: 023 (1.00)

c.

REFERENCE:

SM-019-A pages 13 and 14 LOs 3.o. and 3.p.

[3.7/3.8]

206000K419 ..(KA's)

ANSWER: 024 (1.00)

b.

REFERENCE:

SM-018-A page 7 LO 4.b.

[3.8/3.6]

209001A401 ..(KA's)

ANSWER: 025 (1.00)

b.

REFERENCE:

SM-018-A page 8 LO 13.a

[3.0/3.1]

209001K201 ..(KA's)

ANSWER: 026 (1.00)

c.

REFERENCE:

LEP-03 Rev. 12 page 3 SM-005-A LO 8.f Facility Exam Bank Question
Number, LLE0049 Modified

[4.3/4.4]

211000K301 ..(KA's)

ANSWER: 027 (1.00)

c.

REFERENCE:

SM-003-A Rev. 1, Page 27 LO 8

[4.0/4.1]

212000A216 ..(KA's)

ANSWER: 028 (1.00)

d.

REFERENCE:

SM-003-A Rev.1 page 12 LOs 4.b, 4.e and 4.f

[3.4./3.4]

212000A108 ..(KA's)

ANSWER: 029 (1.00)

c.

REFERENCE:

SM-009-B Rev. 0 page 9 LO 3.a

[3.0/3.1]

215003K503 ..(KA's)

ANSWER: 030 (1.00)

d.

REFERENCE:

SM-009-A Rev.0 page 12 LO 3.a

[3.2/3.2]

215004K406 ..(KA's)

ANSWER: 031 (1.00)

a.

REFERENCE:

SM-009-A Rev. 0 page 15

[3.1/3.3]

215004K602 ..(KA's)

ANSWER: 032 (1.00)

a.

REFERENCE:

SM-009 Rev. 0 page 2 LO 4.g

[4.0/4.0]

215005K301 ..(KA's)

ANSWER: 033 (1.00)

c.

REFERENCE:

BSEP/Vol. II/SD-09 page 68

[2.9/3.2]

215005K504 ..(KA's)

ANSWER: 034 (1.00)

d.

REFERENCE:

SM-118-A Rev. 0 page 9 LO 5.1

[3.1/3.2]

216000K501 ..(KA's)

ANSWER: 035 (1.00)

d.

REFERENCE:

SM-016-A page 38 LO 4.b

[3.4/3.3]

217000A203 ..(KA's)

ANSWER: 036 (1.00)

b.

REFERENCE:

SM-020-A Rev.0 page 15 LO 16.c Facility Exam Bank, Question Number
LLA0113 Modified

[3.9/4.1]

218000K601 ..(KA's)

ANSWER: 037 (1.00)

c.

REFERENCE:

SM-020-A Rev. 0 page 6 LO 8

[3.4/3.6]

218000A203 ..(KA's)

ANSWER: 038 (1.00)

d.

REFERENCE:

SM-032-C Rev. 2 page 21 LO 6.a

[3.8/3.8]

259002A101 ..(KA's)

ANSWER: 039 (1.00)

d.

REFERENCE:

SM-032-C Rev. 2 page 47 LO 5

[3.0/3.0]

259002A306 ..(KA's)

ANSWER: 040 (1.00)

d.

REFERENCE:

SM-010-A Rev. 2 page 24 LO 9.g

[3.1/3.2]

261000K605 ..(KA's)

ANSWER: 041 (1.00)

a.

REFERENCE:

SM-039-A page 72 LOs 3 and 4

[3.8/3.7]

264000K408 ..(KA's)

ANSWER: 042 (1.00)

c.

REFERENCE:

SM-008-A page 18 LO 6.d

[3.6/3.7]

201003K404 ..(KA's)

ANSWER: 043 (1.00)

d.

REFERENCE:

SSM 27-2B RWM page 23 LO 7.a Facility Exam Bank, Question Number LLN0171

[3.2/3.1]

201006A301 ..(KA's)

ANSWER: 044 (1.00)

c.

REFERENCE:

SSM 27-2B RWM page 23 LO 7.a Facility Exam Bank, Question Number LLN0007

[3.2/3.2]

201006A405 ..(KA's)

ANSWER: 045 (1.00)

a.

REFERENCE:

SM-002-A Rev. 0 page 21 LO 8

[3.6/3.7]

202001K101 ..(KA's)

ANSWER: 046 (1.00)

b.

REFERENCE:

SM-002-A Rev. 0 page 12 LO 5

[3.9/3.9]

202001K401 ..(KA's)

ANSWER: 047 (1.00)

d.

REFERENCE:

SM-014-A Rev. 0 page 32 LO 9.d

[3.7/3.8]

204000K108 ..(KA's)

ANSWER: 048 (1.00)

a.

REFERENCE:

20P-17 Rev .106 page 32 Section 5.4.2 caution 64/65 Facility Exam Bank,
Question Number LLN0096 Modified

[3.2/3.3]

205000G010 ..(KA's)

ANSWER: 049 (1.00)

a.

REFERENCE:

SM-007-A Rev. 0 page 7 LO 3

[3.3/3.3]

214000K105 ..(KA's)

ANSWER: 050 (1.00)

d.

REFERENCE:

SM-009-E Rev. 01 page 17 LO 4

[3.1/3.3]

215002A203 ..(KA's)

ANSWER: 051 (1.00)

d.

REFERENCE:

SM-009-E Rev. 01 page 4 LO 7.c

[2.8/3.1]

215002K605 ..(KA's)

ANSWER: 052 (1.00)

b.

REFERENCE:

SM-017-A Rev. 0 page 25 LO 26

[3.5/3.4]

226001A403 ..(KA's)

ANSWER: 053 (1.00)

d.

REFERENCE:

EOP-02 Primary Containment Control Steps PC/P-4 and 5 SM-017-A LO 26

[3.8/3.6]

230000A402 ..(KA's)

ANSWER: 054 (1.00)

b.

REFERENCE:

SM-025-A Rev. 0 page 11 LO 9.b

[3.2/3.2]

239001K602 ..(KA's)

ANSWER: 055 (1.00)

a.

REFERENCE:

SM-025-A Rev. 0 page 64 LO 6

[3.2/3.3]

239001K201 ..(KA's)

ANSWER: 056 (1.00)

c.

REFERENCE:

SM-026-C Rev. 2 page 24 LO 15

[3.8/3.9]

245000A207 ..(KA's)

ANSWER: 057 (1.00)

d.

REFERENCE:

CLS-SM-032-A Rev. 2 page 81

[3.1/3.1]

256000K105 ..(KA's)

ANSWER: 058 (1.00)

a.

REFERENCE:

SM-050B Rev. 2 page 24 LO 4

[3.4/3.5]

262001G007 ..(KA's)

ANSWER: 059 (1.00)

a.

REFERENCE:

SM-030-A Rev. 0 pages 38 and 39

[3.3/3.3]

271000A301 ..(KA's)

ANSWER: 060 (1.00)

a.

REFERENCE:

SM-003-A Rev. 1 page 19 SM-030-A Rev. 0 page 21 SM-011-B Rev. 2 page
2 LO 8.a

[3.9/4.2]

239001A205 ..(KA's)

ANSWER: 061 (1.00)

b.

REFERENCE:

SM-001-A Rev. 0 page 21 LO 7

[3.4/3.5]

290002K112 ..(KA's)

ANSWER: 062 (1.00)

a.

REFERENCE:

SM-006-A Rev. 0 page 17 LO 3.b

[3.4/3.6]

268000A401 ..(KA's)

ANSWER: 063 (1.00)

a.

REFERENCE:

SM-007-A pages 15, 16, 38 and 45

[3.3/4.1]

234000K402 ..(KA's)

ANSWER: 064 (1.00)

c.

REFERENCE:

SM-017-A Rev .0 page 13 LO 4

[2.9/3.0]

233000K102 ..(KA's)

ANSWER: 065 (1.00)

d.

REFERENCE:

SM-300-E Rev. 2 page 9 step RC/L-12 LO 23 Facility Exam Bank, Question
Number LLE0338 Modified

[4.1/4.3]

295037K101 ..(KA's)

ANSWER: 066 (1.00)

b.

REFERENCE:

AOP-03 page 4 step 3.2(3) SM-002-A LO 39 Facility Exam Bank, Question
Number LLA0115

[3.8/3.9]

295014K106 ..(KA's)

ANSWER: 067 (1.00)

b.

REFERENCE:

SM-050-B page 20 LO 13.c

[3.5/3.7]

295003A204 ..(KA's)

ANSWER: 068 (1.00)

b.

REFERENCE:

AOP 36.1 Rev. 11 page 4 section 2.2 Facility Exam Bank, Question Number
LLA0204 Modified

[3.7/3.7]

295003K306 ..(KA's)

ANSWER: 069 (1.00)

c.

REFERENCE:

SM-300-C Rev. 1 page 2 LO 2

[4.1/4.2]

295006G010 ..(KA's)

ANSWER: 070 (1.00)

c.

REFERENCE:

SM-020-A page 7 LO 9

[3.9/4.1]

295007A104 ..(KA's)

ANSWER: 071 (1.00)

c.

REFERENCE:

SM-001-A Rev. 0 page 12 LO 9

[2.7/2.9]

295009K101 ..(KA's)

ANSWER: 072 (1.00)

c.

REFERENCE:

SM-002-A Rev. 0 page 25 LO 3.h

[3.2/3.3]

295009K301 ..(KA's)

ANSWER: 073 (1.00)

a.

REFERENCE:

SM-00-A Rev. 0 pages 7 and 8 LO 15.c

[3.4/3.8]

295010A201 ..(KA's)

ANSWER: 074 (1.00)

d.

REFERENCE:

2-OP-10 Rev. 49 page 22 SM-010-A page 12 LO 3

[3.1/3.4]

295010A105 ..(KA's)

ANSWER: 075 (1.00)

b.

REFERENCE:

AOP 30.0 Rev. 3 page 3 SM-020-A Rev. 0 LO 22

[3.8/3.6]

295013G010 ..(KA's)

ANSWER: 076 (1.00)

c.

REFERENCE:

AOP-02-. Rev. 5 page 4

[3.9/3.9]

295014K207 ..(KA's)

ANSWER: 077 (1.00)

d.

REFERENCE:

EOP-01-LEP-02 Rev. 10 page 17 SM-300-J Rev. 0 LO 5.

[4.0/4.1]

295015K204 ..(KA's)

ANSWER: 078 (1.00)

a.

REFERENCE:

AOP-32.0 Rev. 24 page 5

[4.0/4.1]

295016K202 ..(KA's)

ANSWER: 079 (1.00)

c. or b.

Mike Erato
11/9/94

REFERENCE:

SM-305-A page 32 Rev. 0 LO 16.b

[3.2/3.4]

295023K204 ..(KA's)

ANSWER: 080 (1.00)

d.

REFERENCE:

AOP-07.0 Rev .2 page 3 LO 31

[3.9/3.9]

295023G010 ..(KA's)

ANSWER: 081 (1.00)

c.

REFERENCE:

SM-300-K Rev. 0 page 3 LO 3

[3.5/4.0]

295024K307 ..(KA's)

ANSWER: 082 (1.00)

b.

REFERENCE:

SM-002-A page 33 Rev. 0 LO .19

[3.9/4.1]

295025K204 ..(KA's)

ANSWER: 083 (1.00)

d.

REFERENCE:

AOP-04 Rev.9 page 4

[3.8/3.7]

295001G010 ..(KA's)

ANSWER: 084 (1.00)

b.

REFERENCE:

AOP-4.4 Rev. 4 page 3

[3.4/3.4]

295001K207 ..(KA's)

ANSWER: 085 (1.00)

b.

REFERENCE:

AOP-37 Rev. 3 page 3 SM-025-A Rev.0 LO 9.f

[3.2/3.3]

295002K204 ..(KA's)

ANSWER: 086 (1.00)

d.

REFERENCE:

SM-025-A page 18 LO 5.j

[3.4/3.4]

295002G006 ..(KA's)

ANSWER: 087 (1.00)

a.

REFERENCE:

SM-50-B Rev. 2 page 23 LO 7

[3.3/3.4]

295004K105 ..(KA's)

ANSWER: 088 (1.00)

a.

REFERENCE:

SM-016-A Rev. 1 page 51 LO 8.c

[3.2/3.3]

295004A204 ..(KA's)

ANSWER: 089 (1.00)

c.

REFERENCE:

SM-300-C page 5

[3.2/3.3]

295005K208 ..(KA's)

ANSWER: 090 (1.00)

b.

REFERENCE:

20P-14 Rev. 88 page 15 CAUTION SM-014-A LO 9.e

[3.1/3.1]

295008K209 ..(KA's)

ANSWER: 091 (1.00)

b.

REFERENCE:

SM-300-L page 56 LO 3.g

[3.3/3.5]

295012K101 ..(KA's)

ANSWER: 092 (1.00)

a.

REFERENCE:

AOP-19.0 Rev. 6 No Facility LO

[3.4/3.6]

295018K202 ..(KA's)

ANSWER: 093 (1.00)

c.

REFERENCE:

SM-021-A Rev. 1 page 7 LO 9.a Facility Exam Bank, Question Number
LLN0081 Modified

[2.9/2.9]

295018A205 ..(KA's)

ANSWER: 094 (2.00)

a. 7

b. 4

c. 2

d. 2

REFERENCE:

AOP-20.0 Rev. 15 SM-046-A LO 7

[3.5/3.4]

295019K302 ..(KA's)

ANSWER: 095 (1.00)

d.

REFERENCE:

SM-012-A Rev. 0 page 9 LO 6

[3.4/3.8]

295020A206 ..(KA's)

ANSWER: 096 (1.00)

c.

REFERENCE:

AOP-02.1 Rev. 4 page 3

[3.7/3.9]

295022K301 ..(KA's)

ANSWER: 097 (1.00)

c.

REFERENCE:

Unit 2 Caution 1 Chart

[3.7/3.9]

295028A203 ..(KA's)

ANSWER: 098 (1.00)

b.

REFERENCE:

SM-300-M page 11 LO 4.a

[3.7/3.9]

295032A105 ..(KA's)

ANSWER: 099 (1.00)

C.

REFERENCE:

SM-300-M page 2 LO 4.c Facility Exam Bank, Question Number LLE0291

[3.0/3.2]

295036A201 ..(KA's)

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

R O Exam B W R Reactor
Organized by Question Number

| <u>QUESTION</u> | <u>VALUE</u> | <u>REFERENCE</u> |
|-----------------|--------------|------------------|
| 001 | 1.00 | 9001011 |
| 002 | 1.00 | 9001012 |
| 003 | 1.00 | 9001013 |
| 004 | 1.00 | 9001014 |
| 005 | 1.00 | 9001016 |
| 006 | 1.00 | 9001017 |
| 007 | 1.00 | 9001018 |
| 008 | 1.00 | 9001020 |
| 009 | 1.00 | 9001021 |
| 010 | 1.00 | 9001023 |
| 011 | 1.00 | 9001024 |
| 012 | 1.00 | 9001025 |
| 013 | 1.00 | 9001028 |
| 014 | 1.00 | 9001030 |
| 015 | 1.00 | 22022 |
| 016 | 1.00 | 9001033 |
| 017 | 1.00 | 22031 |
| 018 | 1.00 | 15478 |
| 019 | 1.00 | 9001037 |
| 020 | 1.00 | 9001039 |
| 021 | 1.00 | 20144 |
| 022 | 1.00 | 9001041 |
| 023 | 1.00 | 9001042 |
| 024 | 1.00 | 22038 |
| 025 | 1.00 | 9001045 |
| 026 | 1.00 | 9001046 |
| 027 | 1.00 | 22041 |
| 028 | 1.00 | 9001049 |
| 029 | 1.00 | 9001050 |
| 030 | 1.00 | 9001051 |
| 031 | 1.00 | 25102 |
| 032 | 1.00 | 9001053 |
| 033 | 1.00 | 9001054 |
| 034 | 1.00 | 9001055 |
| 035 | 1.00 | 9001056 |
| 036 | 1.00 | 9001057 |
| 037 | 1.00 | 9001058 |
| 038 | 1.00 | 9001059 |
| 039 | 1.00 | 9001060 |
| 040 | 1.00 | 9001061 |
| 041 | 1.00 | 9001062 |
| 042 | 1.00 | 22023 |
| 043 | 1.00 | 9001064 |
| 044 | 1.00 | 9001065 |
| 045 | 1.00 | 9001066 |
| 046 | 1.00 | 9001067 |
| 047 | 1.00 | 9001069 |
| 048 | 1.00 | 9001070 |
| 049 | 1.00 | 20132 |

R O Exam B W R Reactor
Organized by Question Number

| <u>QUESTION</u> | <u>VALUE</u> | <u>REFERENCE</u> |
|-----------------|--------------|------------------|
| 050 | 1.00 | 9001074 |
| 051 | 1.00 | 9001075 |
| 052 | 1.00 | 9001076 |
| 053 | 1.00 | 9001078 |
| 054 | 1.00 | 9001079 |
| 055 | 1.00 | 9001080 |
| 056 | 1.00 | 9001081 |
| 057 | 1.00 | 9001082 |
| 058 | 1.00 | 22073 |
| 059 | 1.00 | 9001084 |
| 060 | 1.00 | 9001086 |
| 061 | 1.00 | 9001087 |
| 062 | 1.00 | 9001088 |
| 063 | 1.00 | 9001090 |
| 064 | 1.00 | 20153 |
| 065 | 1.00 | 9001092 |
| 066 | 1.00 | 9001093 |
| 067 | 1.00 | 9001095 |
| 068 | 1.00 | 9001096 |
| 069 | 1.00 | 9001098 |
| 070 | 1.00 | 9001099 |
| 071 | 1.00 | 9001101 |
| 072 | 1.00 | 25081 |
| 073 | 1.00 | 9001103 |
| 074 | 1.00 | 9001104 |
| 075 | 1.00 | 9001105 |
| 076 | 1.00 | 9001107 |
| 077 | 1.00 | 9001109 |
| 078 | 1.00 | 9001111 |
| 079 | 1.00 | 9001112 |
| 080 | 1.00 | 9001113 |
| 081 | 1.00 | 20174 |
| 082 | 1.00 | 9001117 |
| 083 | 1.00 | 9001121 |
| 084 | 1.00 | 25147 |
| 085 | 1.00 | 9001123 |
| 086 | 1.00 | 9001124 |
| 087 | 1.00 | 9001125 |
| 088 | 1.00 | 9001126 |
| 089 | 1.00 | 25171 |
| 090 | 1.00 | 9001128 |
| 091 | 1.00 | 9001129 |
| 092 | 1.00 | 22093 |
| 093 | 1.00 | 9001131 |
| 094 | 2.00 | 9001132 |
| 095 | 1.00 | 9001133 |
| 096 | 1.00 | 9001134 |
| 097 | 1.00 | 20088 |
| 098 | 1.00 | 22119 |

R O E x a m B W R R e a c t o r
o r g a n i z e d b y Q u e s t i o n N u m b e r

| <u>QUESTION</u> | <u>VALUE</u> | <u>REFERENCE</u> |
|-----------------|--------------|------------------|
| 099 | 1.00 | 9001140 |
| | ----- | |
| | 100.00 | |
| | ----- | |
| | ----- | |
| | 100.00 | |

MASTER COPY

MASTER COPY

R O Exam B W R Reactor
Organized by KA Group

PLANT WIDE GENERICS

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 001 | 1.00 | 294001A102 |
| 012 | 1.00 | 294001A103 |
| 005 | 1.00 | 294001A111 |
| 006 | 1.00 | 294001A113 |
| 013 | 1.00 | 294001A113 |
| 009 | 1.00 | 294001A114 |
| 008 | 1.00 | 294001A115 |
| 007 | 1.00 | 294001K101 |
| 003 | 1.00 | 294001K102 |
| 002 | 1.00 | 294001K102 |
| 004 | 1.00 | 294001K102 |
| 010 | 1.00 | 294001K103 |
| 011 | 1.00 | 294001K103 |

PWG Total 13.00

PLANT SYSTEMS

Group I

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 014 | 1.00 | 201001A308 |
| 015 | 1.00 | 201001K110 |
| 016 | 1.00 | 201002A301 |
| 017 | 1.00 | 202002K305 |
| 018 | 1.00 | 202002K402 |
| 019 | 1.00 | 203000K201 |
| 020 | 1.00 | 203000K401 |
| 022 | 1.00 | 206000G013 |
| 021 | 1.00 | 206000K407 |
| 023 | 1.00 | 206000K419 |
| 024 | 1.00 | 209001A401 |
| 025 | 1.00 | 209001K201 |
| 026 | 1.00 | 211000K301 |
| 028 | 1.00 | 212000A108 |
| 027 | 1.00 | 212000A216 |
| 029 | 1.00 | 215003K503 |
| 030 | 1.00 | 215004K406 |
| 031 | 1.00 | 215004K602 |
| 032 | 1.00 | 215005K301 |
| 033 | 1.00 | 215005K504 |
| 034 | 1.00 | 216000K501 |
| 035 | 1.00 | 217000A203 |
| 037 | 1.00 | 218000A203 |
| 036 | 1.00 | 218000K601 |

RO Exam BWR Reactor
Organized by KA Group

PLANT SYSTEMS

Group I

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 038 | 1.00 | 259002A101 |
| 039 | 1.00 | 259002A306 |
| 040 | 1.00 | 261000K605 |
| 041 | 1.00 | 264000K408 |
| ----- | | |
| PS-I Total | 28.00 | |

Group II

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 042 | 1.00 | 201003K404 |
| 043 | 1.00 | 201006A301 |
| 044 | 1.00 | 201006A405 |
| 045 | 1.00 | 202001K101 |
| 046 | 1.00 | 202001K401 |
| 047 | 1.00 | 204000K108 |
| 048 | 1.00 | 205000G010 |
| 049 | 1.00 | 214000K105 |
| 050 | 1.00 | 215002A203 |
| 051 | 1.00 | 215002K605 |
| 052 | 1.00 | 226001A403 |
| 053 | 1.00 | 230000A402 |
| 060 | 1.00 | 239001A205 |
| 055 | 1.00 | 239001K201 |
| 054 | 1.00 | 239001K602 |
| 056 | 1.00 | 245000A207 |
| 057 | 1.00 | 256000K105 |
| 058 | 1.00 | 262001G007 |
| 059 | 1.00 | 271000A301 |
| ----- | | |
| PS-II Total | 19.00 | |

Group III

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 064 | 1.00 | 233000K102 |
| 063 | 1.00 | 234000K402 |
| 062 | 1.00 | 268000A401 |
| 061 | 1.00 | 290002K112 |
| ----- | | |
| PS-III Total | 4.00 | |
| ----- | | |

R O Exam B W R Reactor
Organized by KA Group

PLANT SYSTEMS

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|-----------|
| PS Total | 51.00 | |

EMERGENCY PLANT EVOLUTIONS

Group I

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 089 | 1.00 | 295005K208 |
| 069 | 1.00 | 295006G010 |
| 070 | 1.00 | 295007A104 |
| 071 | 1.00 | 295009K101 |
| 072 | 1.00 | 295009K301 |
| 074 | 1.00 | 295010A105 |
| 073 | 1.00 | 295010A201 |
| 066 | 1.00 | 295014K106 |
| 076 | 1.00 | 295014K207 |
| 077 | 1.00 | 295015K204 |
| 081 | 1.00 | 295024K307 |
| 082 | 1.00 | 295025K204 |
| 065 | 1.00 | 295037K101 |
| ----- | | |
| EPE-I Total | 13.00 | |

Group II

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 083 | 1.00 | 295001G010 |
| 084 | 1.00 | 295001K207 |
| 086 | 1.00 | 295002G006 |
| 085 | 1.00 | 295002K204 |
| 067 | 1.00 | 295003A204 |
| 068 | 1.00 | 295003K306 |
| 088 | 1.00 | 295004A204 |
| 087 | 1.00 | 295004K105 |
| 090 | 1.00 | 295008K209 |
| 091 | 1.00 | 295012K101 |
| 075 | 1.00 | 295013G010 |
| 078 | 1.00 | 295016K202 |
| 093 | 1.00 | 295018A205 |
| 092 | 1.00 | 295018K202 |
| 094 | 2.00 | 295019K302 |
| 095 | 1.00 | 295020A206 |
| 096 | 1.00 | 295022K301 |
| 097 | 1.00 | 295028A203 |

R O E x a m B W R R e a c t o r
o r g a n i z e d b y K A G r o u p

EMERGENCY PLANT EVOLUTIONS

Group II

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|-----------|
| EPE-II Total | 19.00 | |

Group III

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 080 | 1.00 | 295023G010 |
| 079 | 1.00 | 295023K204 |
| 098 | 1.00 | 295032A105 |
| 099 | 1.00 | 295036A201 |

| | | |
|---------------|------|--|
| EPE-III Total | 4.00 | |
|---------------|------|--|

| | | |
|-----------|-------|--|
| EPE Total | 36.00 | |
|-----------|-------|--|

| | | |
|------------|--------|--|
| Test Total | 100.00 | |
|------------|--------|--|

5.0 Startup

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps

Loop _____

NOTE: RHR System piping should be flushed prior to cooling the reactor below a pressure of 60 psig; otherwise, there will NOT be enough driving force to completely warm and flush the piping.

1. If this procedure was entered from Section 8.3, and RPV pressure is below 6^r psig, then perform the following:
 - a. N/A Steps 5.4.2.2 through 5.4.2.53 of this section. _____
 - b. Continue in this procedure at Step 5.4.2.54. _____
2. Lower suppression pool level to -31 inches per Section 8.7 of this procedure and return to Step 5.4.2.3 of this section. _____
3. Select RHR loop to be placed in shutdown cooling and place circuit breaker switches to the ON position for the selected RHR loop valves: _____

A RHR Loop _____

B RHR Loop _____

E11-F006A MCC 2XA Compt DE9 _____
E11-F006C MCC 2XA Compt DFO _____
E11-F009 MCC 2XA Compt DH3 _____
E11-V32 MCC 2XA Compt DG3 _____

E11-F006B MCC 2XB Compt DL1 _____
E11-F006D MCC 2XB Compt DL2 _____
E11-F011B MCC 2XB Compt DL6 _____
E11-V33 MCC 2XB Compt DM9 _____
E11-F009 MCC 2XA Compt DH3 _____

4. Open Loop A(B) LPCI Injection Check Valve Bypass Valve, E11-V32(V33). _____
5. Open Loop A(B) LPCI Inboard Injection Valve, E11-F015A(B). _____
6. Verify open Loop A(B) LPCI Outboard Injection Valve, E11-F017A(B). _____
7. Close RHR HX 2A(2B) Outlet Valve, E11-F003A(B). _____
8. Verify the following valves open:
 - a. RHR HX 2A(2B) Bypass Valve, E11-F048A(B). _____
 - b. RHR HX 2A(2B) Inlet Valve, E11-F047A(B). _____

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

9. Verify RHR HX 2A(2B) RHR to Torus Drain Controller, E11-HC-604A(B), is set to zero output. _____
10. Open RHR HX 2A(2B) Drain To Suppression Pool Valve, E11-F011A(B). _____
11. Verify RHR HX 2A(2B) Drain To RCIC Valve, E11-F026A(B), is closed. _____
12. Place Control Switch, E11-S41A(B), to the OPEN position to energize the Air Supply to E11-F053A(B) RHR to Torus Drain Valve. _____
13. Monitor Suppression Pool temperature during the flush to the Suppression Pool. _____
14. If Suppression Pool temperature exceeds 95 deg F, then perform the following:
 - a. Go To EOP-02-PCCP and execute it concurrently with this procedure. _____
 - b. Log Suppression Pool temperature at one-hour intervals. _____

CAUTION

Water can be drained faster through E11-CV-F053A(B) than can be made up through E11-V32(V33). If RHR pressure drops too far below RPV pressure, water hammer may occur. If RHR pressure drops below 40 psig, adequate RHR loop sample flow may NOT be available at the sample station.

15. With RHR to Torus Drain Controller, E11-HC-604A(B) in MANUAL, SLOWLY throttle open RHR to Torus Drain Control Valve, E11-CV-F053A(B), to flush RHR HX downstream piping to the suppression pool. _____
16. Maintain RPV water level between 182 and 192 inches during the flush to the suppression pool as follows:
 - a. If RPV water level CANNOT be maintained above 182 inches, then close E11-F011A(B). _____
 - b. When RPV water level is restored to normal, then reopen E11-F011A(B). _____

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

17. If suppression pool level approaches -27 inches, then perform the following:

- a. With RHR to Torus Drain Controller, E11-HC-604A(B) in MANUAL, throttle closed RHR HX 2A(2B) RHR to Torus Drain Control Valve, E11-CV-F053A(B) to reduce flushing rate to the suppression pool.
- b. Drain Suppression Pool to Radwaste in accordance with Section 8.7, if necessary.

18. While flushing RHR pump downstream piping to the suppression pool, verify RHR HX 2A(2B) outlet conductivity as read on E11-CIS-R001A(B) on Instrument Rack H21-P018(P021) is less than 10 μ mho/cm, OR direct E&RC to sample RHR HX outlet for conductivity.

19. If RHR HX 2A(2B) shell side outlet temperature indicates less than 194°F, OR outlet conductivity is above 10 μ mho/cm, then perform the following:

- a. Direct E&RC to sample RHR HX outlet for conductivity.
- b. Continue flush until conductivity is satisfactory.

20. When BOTH of the following exist:

- RHR HX 2A(2B) outlet temperature as read on either E41-TR-R605 on Panel H12-P614, Point 3(4), or ERFIS shutdown cooling display, is within 110°F of RPV water temperature, AND
- Conductivity is less than 10 μ mho/cm,

Then shut down RHR HX downstream piping flush to suppression pool as follows:

- a. With RHR to Torus Drain Controller, E11-HC-604A(B) in MANUAL, close RHR HX 2A(2B) RHR to Torus Drain Control Valve, E11-CV-F053A(B).
- b. Close Loop A(B) LPCI Injection Check Valve Bypass Valve, E11-V32(V33).
- c. Close Loop A(B) LPCI Inboard Injection Valve, E11-F015A(B).

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

21. Reduce RPV pressure to less than 125 psig per GP-05. _____
22. When RPV pressure is below 125 psig, then continue in this procedure. _____
23. Reset Group 8 isolation logic by depressing both isolation reset push buttons on RTGB Panel P601. _____

R17

CAUTION

Failure to complete each valve operation before performing the next sequential step for Steps 5.4.2.24 through 5.4.2.37 may cause inadvertent draining of the reactor to the Suppression Pool.

24. Verify Shutdown Cooling Inboard Suction Isolation Valve, E11-F009, is closed. _____
25. Open Shutdown Cooling Outboard Suction Throttle Valve, E11-F008. _____

CAUTION

Both loops of LPCI should NOT be isolated during the shutdown cooling mode of operation.

26. Initiate LCOs in accordance with OI-04 for both of the following:
 - A(B) loop LPCI per Tech Spec 3.5.3.2, and _____
 - A(B) loop suppression pool cooling per Tech Spec 3.6.2.2. _____
27. Close RHR Pump 2A & 2C(2B & 2D) Suppression Pool Suction Valve, E11-F020A(B). _____
28. Close the following valves:
 - a. RHR Pump 2A(2B) Suppression Pool Suction Valve, E11-F004A(B). _____
 - b. RHR Pump 2C(2D) Suppression Pool Suction Valve, E11-F004C(D). _____

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

29. Open the following valves:

a. RHR Pump 2A(2B) Shutdown Cooling Suction Valve, E11-F006A(B). _____

b. RHR Pump 2C(2D) Shutdown Cooling Suction Valve, E11-F006C(D). _____

30. Open the following valves to fill shutdown cooling suction piping:

a. Shutdown Cooling Demineralized Water Supply Isolation Valve, E11-F083. _____

b. Shutdown Cooling Demineralized Water Supply Isolation Valve, E11-F084. _____

31. Monitor shutdown cooling demineralized water supply piping flow noise by listening to the pipe. _____

32. When flow into the shutdown cooling suction pipe stops, then close the following valves:

a. Shutdown Cooling Demineralized Water Supply Isolation Valve, E11-F083. _____

b. Shutdown Cooling Demineralized Water Supply Isolation Valve, E11-F084. _____

33. Close Shutdown Cooling Outboard Suction Throttle Valve, E11-F008. _____

34. Open Shutdown Cooling Inboard Suction Isolation Valve, E11-F009. _____

CAUTION

DC Limitorque valves are limited to a duty cycle of three starts in five minutes followed by a fifty-minute cooldown period. Any valve actuation whether in the form of a throttle action, a continuous stroke, or an auto-actuated movement is considered a motor start. Failure to adhere to the duty cycle requirements may cause DC valve motor failures.

35. While closely monitoring RPV water level on Panel P603 and locally monitoring RHR piping for water hammer, slowly throttle open Shutdown Cooling Outboard Suction Throttle Valve, E11-F008. _____

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

36. If water hammer occurs, then perform the following:

- a. Close Shutdown Cooling Outboard Suction Throttle Valve, E11-F008. _____
- b. Request Technical Support to examine affected piping. _____
- c. When Technical Support has determined that shutdown cooling may recommence, slowly throttle open Shutdown Cooling Outboard Suction Throttle Valve, E11-F008. _____

37. If RPV water level drops more than 10 inches, then perform the following:

- a. Close Shutdown Cooling Inboard Suction Isolation Valve, E11-F009. _____
- b. Close Shutdown Cooling Outboard Suction Throttle Valve, E11-F008. _____
- c. Refill Shutdown cooling suction piping by repeating Steps 5.4.2.30 through 5.4.2.36. _____

38. If RPV water level is stable and NO water hammer is apparent, then fully open Shutdown Cooling Outboard Suction Throttle Valve, E11-F008. _____

39. Close RHR HX 2A(2B) Bypass Valve, E11-F048A(B). _____

40. If Loop B of RHR is being placed in Shutdown Cooling, and the alternate flush to Radwaste is desired, then perform the following:

- a. N/A Steps 5.4.2.41 through 5.4.2.46.c. _____
- b. Go to Section 8.5 of this procedure. _____

41. With RHR to Torus Drain Controller, E11-HC-604A(B) in MANUAL, slowly throttle open RHR to Torus Drain Control Valve, E11-CV-F053A(B), to commence RHR pump upstream piping flush to the suppression pool. _____

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

42. Maintain RPV water level between 182 and 192 inches during flush to the suppression pool as follows:
- a. If RPV water level CANNOT be maintained above 182 inches, then close E11-F011A(B). _____
 - b. When RPV water level is restored to normal, then reopen E11-F011A(B). _____
43. If suppression pool level approaches -27 inches, then perform the following:
- a. With RHR to Torus Drain Controller, E11-HC-604A(B) in MANUAL, throttle closed RHR HX 2A(2B) RHR to Torus Drain Control Valve, E11-CV-F053A(B) reduce flushing rate to the suppression pool. _____
 - b. Drain Suppression Pool to Radwaste in accordance with Section 8.7, if necessary. _____
44. While flushing RHR pump upstream piping to the suppression pool, verify RHR HX 2A(2B) outlet conductivity as read on E11-CIS-R001A(B) on Instrument Rack H12-P018(P021) is less than 10 μ mho/cm, OR direct E&RC to sample RHR HX outlet for conductivity. _____
45. If RHR HX 2A(2B) shell side outlet temperature indicates less than 194°F, OR outlet conductivity is above 10 μ mho/cm, then perform the following:
- a. Direct E&RC to sample RHR HX outlet for conductivity. _____
 - b. Continue flush until the conductivity is satisfactory. _____

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

46. When BOTH of the following exist:

- RHR HX 2A(2B) inlet temperature as read on either E41-TR-R605 on Panel H12-P614, Point 1(2), or ERFIS shutdown cooling display, is within 110°F of RPV water temperature, AND
- Conductivity is less than 10 μ mho/cm,

Then shut down RHR pump upstream piping flush to suppression pool as follows:

- a. Close RHR HX 2A(2B) Drain to Suppression Pool Valve, E11-F011A(B).
 - b. With RHR to Torus Drain Controller, E11-HC-604A(B) in MANUAL, close RHR HX 2A(2B) RHR to Torus Drain Control Valve, E11-CV-F053A(B).
 - c. Place Control Switch, E11-S41A(B), to CLOSE position to deenergize the Air Supply to E11-F053A(B) RHR to Torus Drain Valve.
47. Open RHR HX 2A(2B) Bypass Valve, E11-F048A(B).
48. Verify RHR HX 2A(2B) Outlet Valve, E11-F003A(B), is closed.
49. Fill and vent Loop A(B) of the RHR System per Section 8.1 of this procedure and return to Step 5.4.2.50.
50. When RHR Loop A(B) is filled and vented, then continue in this procedure.
51. Close RHR HX 2A(2B) Bypass Valve, E11-F048A(B).
52. Open Loop A(B) LPCI Inboard Injection Valve, E11-F015A(B).
53. Close RHR HX 2A(2B) Inlet Valve, E11-F047A(B), to minimize the hydraulic shock and initial cooldown rate created by starting the RHR pump.

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

R17

CAUTION

Failure to complete each valve operation before performing the next sequential step for Steps 5.4.2.54 to 5.4.2.55 may cause inadvertent draining of the reactor to the Suppression Pool.

- | | | |
|--|-------|--|
| 54. Verify Loop A(B) Minimum Flow Bypass Valve, E11-F007A(B), is closed. | _____ | |
| 55. Open Loop A(B) minimum flow bypass valve breaker, Compartment DF1(DL3) on 480V MCC 2XA(2XB). | _____ | |
| 56. Stop reactor recirculation pump in the loop to be utilized for shutdown cooling per OP-02, and return to Step 5.4.2.57 of this procedure. | _____ | |
| 57. Ensure closed Reactor Recirculation Pump A(B) Discharge Valve, B32-F031A(B). | _____ | |
| 58. Ensure open Reactor Recirculation Pump A(B) Suction Valve, B32-F023A(B). | _____ | |
| 59. If recirculation loop temperature is more than 100°F below reactor saturation temperature, then close Reactor Recirculation Pump A(B) Discharge Bypass Valve, B32-F032A(B). | _____ | |
| 60. If recirculation loop temperature is less than 100°F below reactor saturation temperature, then ensure open Reactor Recirculation Pump A(B) Discharge Bypass Valve B32-F032A(B). | _____ | |
| 61. If one reactor recirculation pump is operating, then establish and maintain RPV water level between 180 and 200 inches on B21-LI-R605A(P603) or -R605B(P601). | _____ | |
| 62. If NO reactor recirculation pumps are operating, then establish and maintain RPV water level between 200 and 220 inches on B21-LI-R605A(P603) or -R605B(P601), OR as directed by the Shift Supervisor. | _____ | |
| 63. Monitor reactor recirculation loop temperature on B32-TR-R650(P603) to ensure reactor recirculation loop heatup and cooldown rates do NOT exceed 100°F/hr. | _____ | |

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

64. Monitor Reactor Saturation Temperature (T_{SAT}) as determined from Reactor Steam Dome Pressure to ensure reactor vessel cooldown rates do NOT exceed 100°F/hr, OR 50°F/hr with recirculation loop temperature less than 300°F.

CAUTION

The maximum temperature of the RHR HX service water outlet shall NOT exceed 186°F.

65. Monitor RHR HX SW discharge temperature on E41-TR-R605 Point 5(6) on Panel H12-P614 to ensure temperature does not exceed 170°F.

R11

NOTE: Operation of RHR under minimum flow conditions should be minimized.

CAUTION

Failure to maintain RHR total flow rate at or above 4150 gpm will cause overheating of the RHR pump.

CAUTION

The maximum RPV heatup or cooldown rate of 100°F in any 1 hour period shall NOT be exceeded during heatup or cooldown with RHR System.

CAUTION

The cooldown rate should be decreased to less than 50°F/hr when recirculation loop temperature is below 300°F.

CAUTION

The differential temperature of 110°F between the RHR HX outlet and recirculation loop should NOT be exceeded during shutdown cooling.

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

CAUTION

The RPV should NOT be cooled down below a temperature of 70°F until reactor vessel head closure studs have been detensioned.

66. Start desired Loop A(B) RHR pump. _____
67. Immediately throttle open RHR HX 2A(2B) Bypass Valve, E11-F048A(B) and establish RHR total flow rate between 4500 and 6500 gpm. _____
68. If Reactor Recirculation Pump A(B) Discharge Bypass Valve, B32-F032A(B), is closed, then perform the following:
 - a. Bump open Reactor Recirculation Pump A(B) Discharge Bypass Valve, B32-F032A(B), as needed to maintain a recirculation loop heatup rate below 100°F/hr. _____
 - b. When reactor recirculation loop temperature is approximately equal to reactor vessel temperature, then fully open Reactor Recirculation Pump A(B) Discharge Bypass Valve, B32-F032A(B). _____

CAUTION

IF any of the four fuel assemblies surrounding each in-core instrumentation string have been removed and NOT replaced with blade guides, THEN failure to limit RHR total flow to less than 6500 gpm may cause damage to in-core instrumentation from flow induced vibration.

69. If an RHR total flow rate between 5000 and 10,000 gpm is desired, then throttle open RHR HX 2A(2B) Bypass Valve, E11-F048A(B), to establish desired flowrate. _____

CAUTION

RHR service water flow rate of 6000 gpm should NOT be exceeded until RPV pressure is at or below 75 psig.

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

CAUTION

During shutdown cooling, failure to maintain RHR Service Water pressure above RHR pressure may cause inleakage of radioactive water into the RHR Service Water System.

70. Throttle RHR HX 2A(2B) SW Discharge Valve, E11-PDV-F068A(B), to establish minimum Service Water flow rates to RHR HX 2A(2B) as follows:

- a. IF BOTH RHR Service Water Booster Pumps are operating (preferred), THEN establish 5000 to 5500 gpm flow. _____
- b. IF one RHR Service Water Booster Pump is operating, THEN establish 2000 to 3000 gpm flow. _____

71. Open RHR HX 2A(2B) Inlet Valve, E11-F047A(B). _____

R15

NOTE: A target cooldown rate of 25°/hr is recommended by GE to minimize release of corrosion product activity during cooldown and depressurization.

72. Perform BOTH of the following to establish RPV cooldown rate and maintain desired flow rate:

- a. Slowly throttle open RHR HX 2A(2B) Outlet Valve, E11-F003A(B), as necessary. _____
- b. Slowly throttle closed RHR HX 2A(2B) Bypass Valve, E11-F048A(B), as necessary. _____

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

73. Monitor RPV temperature using one or more of the following methods to ensure RPV cooldown rates do NOT exceed 100°F/hr, OR 50°F/hr with recirculation loop temperature below 300°F.

- a. Reactor Saturation Temperature (T_{SAT}) as determined from Reactor Steam Dome Pressure for conditions where T_{SAT} is above 212°F. _____
- b. Reactor Recirculation Suction Temperature as read on B32-TR-R650(P603) for conditions where recirculation loop is NOT isolated with flow in that loop AND T_{SAT} is below 212°F. _____
- c. RHR HX 2A(2B) Inlet Temperature as read on E41-TR-R605 Point 1(2) on Panel H12-P614 for conditions where RHR HX 2A(2B) is NOT isolated AND T_{SAT} is below 212°F. _____
- d. RHR HX 2A(2B) Outlet Temperature as read on E41-TR-R605 Point 3(4) on Panel H12-P614 for conditions where RHR HX 2A(2B) is isolated AND T_{SAT} is below 212°F. _____

R10

- 74. Request the SRO to provide a normal temperature band to control RPV coolant temperature and log this band in the RO's log book. _____
- 75. If reactor recirculation pumps are NOT operating, AND RPV water level needs to be lowered below 200 inches for maintenance or testing with the steam separator installed, THEN place RHR in shutdown cooling two loop injection mode per Section 8.2 of this procedure and return to Step 5.4.2.76 of this section. _____
- 76. If shutdown cooling flow adjustments are required to maintain RPV cooldown or heatup rates, then refer to Section 8.13 as necessary. _____
- 77. Monitor normal operation of RHR shutdown cooling per Section 6.2 of this procedure. _____

| |
|---|
| <p><u>NOTE:</u> When shutdown cooling is NO longer required, RHR should be shut down per Section 7.2 of this procedure.</p> |
|---|

5.0 STARTUP

5.4 Shutdown Cooling Mode (Continued)

5.4.2 Procedural Steps (Continued)

| Date/Time Completed_____ | |
|--------------------------|----------|
| Performed By (Print) | Initials |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Reviewed By: _____

Shift Supervisor

Figure 1
Thermal Power Limitations

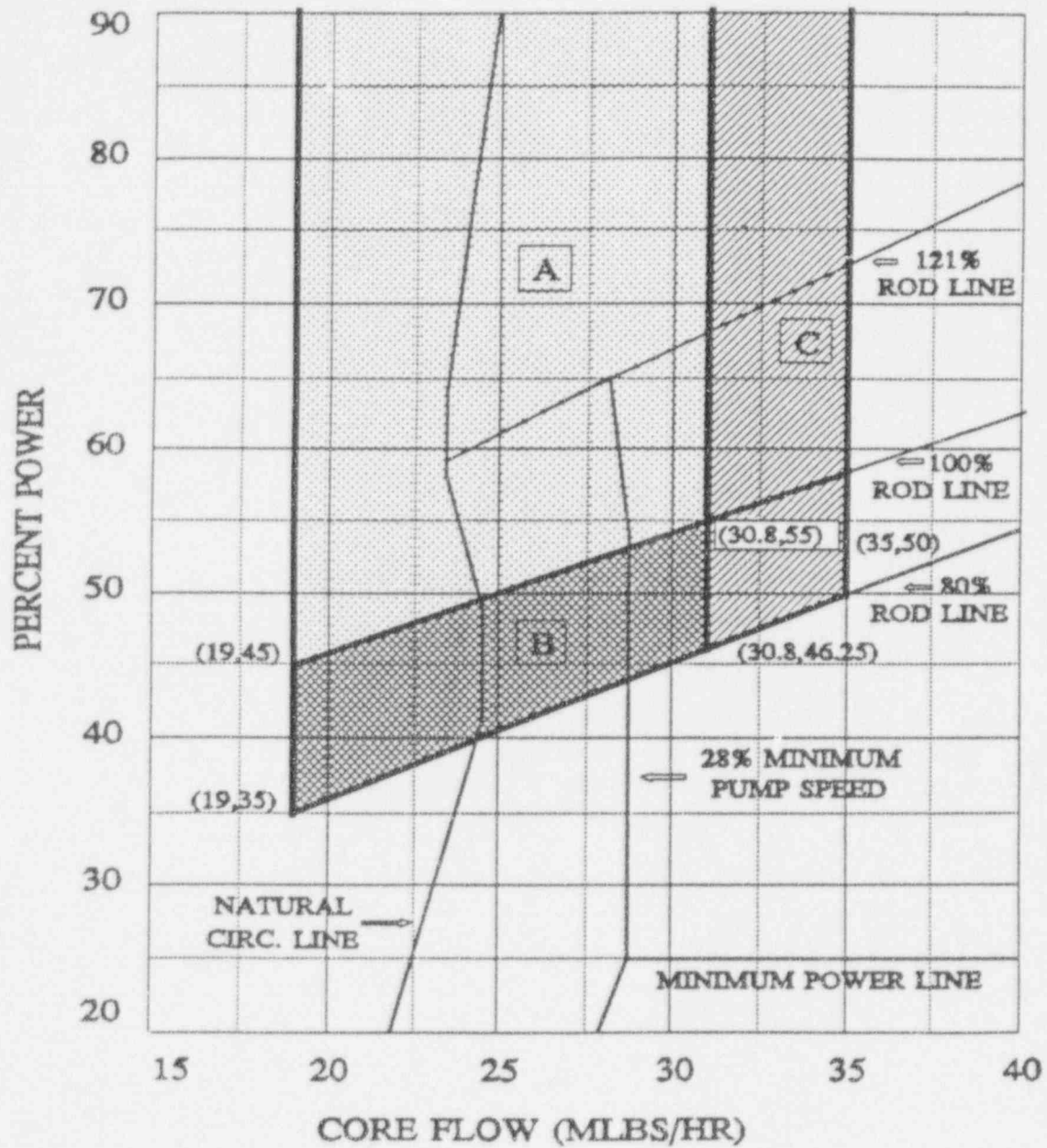


TABLE II - DETECTORS INCLUDED IN APRM CHANNEL (Cont'd)

| Detector Location & Level | Drywell Pent. No. | APRM Channel | Detector Location & Level | Drywell Pent. | APRM Channel |
|---------------------------|-------------------|--------------|---------------------------|---------------|--------------|
| 04-37B | X-100E | C | 12-37B | X-100F | D |
| 36-37B | X-100E | C | 44-37B | X-100F | D |
| 20-21B | X-100E | C | 28-21B | X-100F | D |
| 36-05B | X-100E | C | 28-37D | X-100F | D |
| 20-37B | X-100E | C | 12-21D | X-100F | D |
| 04-21D | X-100E | C | 44-21D | X-100F | D |
| 36-21D | X-100E | C | 28-05D | X-100F | D |
| 20-05D | X-100E | C | 20-45A | X-100F | D |
| 12-45A | X-100E | C | 04-29A | X-100F | D |
| 44-45A | X-100E | C | 36-29A | X-100F | D |
| 28-29A | X-100E | C | 20-13A | X-100F | D |
| 12-13A | X-100E | C | 36-45C | X-100F | D |
| 44-13A | X-100E | C | 20-29C | X-100F | D |
| 28-45C | X-100E | C | 36-13C | X-100F | D |
| 12-29C | X-100E | C | | | |
| 44-29C | X-100E | C | | | |
| 28-13C | X-100E | C | | | |

| Detector Location & Level | Drywell Pent. No. | APRM Channel | Detector Location & Level | Drywell Pent. | APRM Channel |
|---------------------------|-------------------|--------------|---------------------------|---------------|--------------|
| 12-45B | X-100C | E | 20-45B | X-100H | F |
| 44-45B | X-100C | E | 04-29B | X-100H | F |
| 28-29B | X-100C | E | 36-29B | X-100H | F |
| 12-13B | X-100C | E | 20-13B | X-100H | F |
| 44-13D | X-100C | E | 36-45D | X-100H | F |
| 28-45D | X-100C | E | 20-29D | X-100H | F |
| 12-29D | X-100C | E | 36-13D | X-100H | F |
| 44-29D | X-100C | E | 28-37A | X-100H | F |
| 28-13D | X-100C | E | 12-21A | X-100H | F |
| 20-37A | X-100C | E | 44-21A | X-100H | F |
| 04-21A | X-100C | E | 28-05A | X-100H | F |
| 36-21A | X-100C | E | 12-37C | X-100H | F |
| 20-05A | X-100C | E | 44-37C | X-100H | F |
| 04-37C | X-100C | E | 28-21C | X-100H | F |
| 36-37C | X-100C | E | | | |
| 20-21C | X-100C | E | | | |
| 36-05C | X-100C | E | | | |

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Brunswick 94-30/
Master Exam

U. S. NUCLEAR REGULATORY COMMISSION
SITE SPECIFIC EXAMINATION
SENIOR OPERATOR LICENSE
REGION 2

CANDIDATE'S NAME: _____
FACILITY: Brunswick 1 & 2
REACTOR TYPE: BWR-GE4
DATE ADMINISTERED: 94/10/24

INSTRUCTIONS TO CANDIDATE:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

| <u>TEST VALUE</u> | <u>CANDIDATE'S SCORE</u> | <u>%</u> | |
|-------------------|------------------------------|-------------------|--------|
| <u>100.00</u> | <u> </u> | <u> </u> | TOTALS |
| | <u>FINAL GRADE</u> | | |

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

Candidate's Signature

MASTER COPY

ANSWER SHEET

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

| MULTIPLE CHOICE | | | | | | | 023 | a | b | c | d | _____ |
|-----------------|---|---|---|---|-------|--|-----|---|---|---|---|-------|
| 001 | a | b | c | d | _____ | | 024 | a | b | c | d | _____ |
| 002 | a | b | c | d | _____ | | 025 | a | b | c | d | _____ |
| 003 | a | b | c | d | _____ | | 026 | a | b | c | d | _____ |
| 004 | a | b | c | d | _____ | | 027 | a | b | c | d | _____ |
| 005 | a | b | c | d | _____ | | 028 | a | b | c | d | _____ |
| 006 | a | b | c | d | _____ | | 029 | a | b | c | d | _____ |
| 007 | a | b | c | d | _____ | | 030 | a | b | c | d | _____ |
| 008 | a | b | c | d | _____ | | 031 | a | b | c | d | _____ |
| 009 | a | b | c | d | _____ | | 032 | a | b | c | d | _____ |
| 010 | a | b | c | d | _____ | | 033 | a | b | c | d | _____ |
| 011 | a | b | c | d | _____ | | 034 | a | b | c | d | _____ |
| 012 | a | b | c | d | _____ | | 035 | a | b | c | d | _____ |
| 013 | a | b | c | d | _____ | | 036 | a | b | c | d | _____ |
| 014 | a | b | c | d | _____ | | 037 | a | b | c | d | _____ |
| 015 | a | b | c | d | _____ | | 038 | a | b | c | d | _____ |
| 016 | a | b | c | d | _____ | | 039 | a | b | c | d | _____ |
| 017 | a | b | c | d | _____ | | 040 | a | b | c | d | _____ |
| 018 | a | b | c | d | _____ | | 041 | a | b | c | d | _____ |
| 019 | a | b | c | d | _____ | | 042 | a | b | c | d | _____ |
| 020 | a | b | c | d | _____ | | 043 | a | b | c | d | _____ |
| 021 | a | b | c | d | _____ | | 044 | a | b | c | d | _____ |
| 022 | a | b | c | d | _____ | | 045 | a | b | c | d | _____ |

ANSWER SHEET

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

046 a b c d ____

MULTIPLE CHOICE

047 a b c d ____

048 a b c d ____

049 a b c d ____

050 a b c d ____

051 a b c d ____

052 a b c d ____

053 a b c d ____

054 a b c d ____

055 a b c d ____

056 a b c d ____

057 a b c d ____

058 a b c d ____

059 a b c d ____

060 a b c d ____

061 a b c d ____

062 a b c d ____

063 a b c d ____

064 a b c d ____

065 a b c d ____

066 a b c d ____

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068 a b c d ____

069 a b c d ____

070 a b c d ____

071 a b c d ____

072 a b c d ____

073 a b c d ____

074 a b c d ____

075 a b c d ____

076 a b c d ____

077 a b c d ____

078 a b c d ____

079 a b c d ____

080 a b c d ____

081 a b c d ____

082 a b c d ____

083 a b c d ____

084 a b c d ____

085 a b c d ____

086 a b c d ____

087 a b c d ____

088 a b c d ____

089 a b c d ____

090 a b c d ____

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

091 a b c d ____

MULTIPLE CHOICE

092 a b c d ____

093 a b c d ____

094 MATCHING

a ____

b ____

c ____

d ____

MULTIPLE CHOICE

095 a b c d ____

096 a b c d ____

097 a b c d ____

098 a b c d ____

099 a b c d ____

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

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination, the following rules apply:

1. Cheating on the examination will result in a denial of your application and could result in more severe penalties.
2. After you complete the examination, 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.
3. To pass the examination, you must achieve a grade of 80 percent or greater.
4. The point value for each question is indicated in parentheses after the question number.
5. There is a time limit of 4 hours for completing the examination.
6. Use only black ink or dark pencil to ensure legible copies.
7. Print your name in the blank provided on the examination cover sheet and the answer sheet.
8. Mark your answers on the answer sheet provided and do not leave any question blank.
9. If the intent of a question is unclear, ask questions of the examiner only.
10. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.
11. When you complete the examination, assemble a package including the examination questions, examination aids, and answer sheets and give it to the examiner or proctor. Remember to sign the statement on the examination cover sheet.
12. After you have turned in your examination, leave the examination area as defined by the examiner.

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QUESTION: 001 (1.00)

While executing EOP-01, "Reactor Vessel Control Procedure," the status of a critical step changes after having been checked off on the flowchart.

Which one of the following describes the correct action?

- a. Continue on until you come back to the critical step.
- b. Immediately go back to the critical step that changed and reassess.
- c. Go back only when a key parameter changes.
- d. Wait until you finish the current step or section, then go back.

QUESTION: 002 (1.00)

Which one of the following is the preferred method of installing a Temporary Caution Tag on a RTGB panel?

- a. Caution tags are placed on the vertical portion of the RTGB as close as possible to the affected component, with the caution tag sheet placed in an orange colored book kept in an annunciator procedure holder.
- b. A numbered orange caution tag sticker is placed on or near the affected component and the caution tags are placed on the horizontal portion of the RTGB.
- c. A numbered orange caution tag sticker is placed on or as near as possible to the affected component, with the caution tag sheet placed in an orange colored book kept in an annunciator procedure holder.
- d. A numbered orange caution tag sticker is placed on the component along with the caution tags, which are folded as necessary to prevent obstructing of controls and indications.

QUESTION: 003 (1.00)

What action is required when independent verification is required for hanging a clearance?

- a. Each verification must always be separated by time and distance, to ensure independence.
- b. Only the second operator is required to initial the clearance tag sheet.
- c. Independent verification must be used when restoring equipment with a completed valve and electrical lineup to service.
- d. Management oversight verification may be used in place of independent verification, for Control Room components.

QUESTION: 004 (1.00)

Which one of the following is the maximum time period allowed for Temporary Plant Modifications (TPMs) from date of installation, without requiring an extension?

- a. Three months
- b. Six months
- c. Twelve months
- d. 18 months

QUESTION: 005 (1.00)

Which one of the following is a responsibility of the Operations Shift Supervisor with regards to work control?

- a. Training site personnel in the work management process.
- b. Ensuring that work management process functions are coordinated and managed by the Work Control Center and Rad Waste Control Room.
- c. Supervising the Work Management center and Integrated Scheduling subunit managers.
- d. Approving the design of the Work Management process.

QUESTION: 006 (1.00)

A High Pressure Coolant Injection (HPCI) system motor operated valve, being stroke timed in accordance with the Inservice Test (IST) Program, is found to exceed the full stroke time limit on the first attempt.

Which one of the following actions is required?

- a. Do not stroke the valve a second time, declare the valve inoperable and generate a WR/JO.
- b. Stroke the valve a second time, if satisfactory the valve is operable.
- c. Reverify the system test alignment is correct, then attempt a second stroke test of the valve.
- d. Manually operate the valve through a complete cycle to check for binding, then stroke the valve a second time.

QUESTION: 007 (1.00)

Which one of the following statements define "Maximum Safe Operating Radiation Level?"

- a. The radiation level that corresponds to the maximum fission product removal capability of the Standby Gas Treatment system.
- b. The highest radiation level detectable by the Secondary Containment area radiation monitors.
- c. The radiation level above which personnel access necessary for the safe shutdown of the plant will be precluded.
- d. The radiation level at which RPV emergency depressurization is required.

QUESTION: 008 (1.00)

Which one of the following process computer indications indicates a failed or bypassed LPRM on the "LPRM Readings Edit" function?

- a. Magenta "V"
- b. Blue "nnS"
- c. Yellow "nn"
- d. Red "++"

QUESTION: 009 (1.00)

During operation at rated conditions the Control Operator reports an increase in conductivity on P603 Conductivity Recorder, G31-CRS-R601 and a decrease in reactor power of 4%.

Which one of the following is the cause of these indications?

This condition indicates that a:

- a. reactor water cleanup resin bed is exhausted, releasing accumulated silica.
- b. main condenser tube has failed.
- c. resin injection has occurred.
- d. condensate deep bed demineralizer resin bed is exhausted, releasing accumulated boron.

QUESTION: 010 (1.00)

Which one of the following reactor water chemistry parameter combinations have "Action Level" values during Cold Shutdown/Refueling?

- a. pH and Conductivity
- b. pH and Dissolved Oxygen
- c. Dissolved Oxygen and Chloride
- d. Chloride and Conductivity

QUESTION: 011 (1.00)

Which one of the following is the 10 CFR 20 definition of "Total Effective Dose Equivalent (TEDE)?"

It is the sum of the:

- a. Shallow Dose Equivalent, Whole Body (SDE, WB) and the Committed Effective Dose Equivalent (CEDE).
- b. Deep Dose Equivalent (DDE) and the Committed Dose Equivalent (CDE).
- c. Deep Dose Equivalent (DDE) and the Committed Effective Dose Equivalent (CEDE).
- d. Shallow Dose Equivalent, Max Extremity (SDE, ME) and the Deep Dose Equivalent (DDE).

QUESTION: 012 (1.00)

Given the following Conditions:

- 21 year old radiation worker
- Current NRC Forms 4 and 5 are on file for the worker
- The worker has received 47.0 Rem Committed Dose Equivalent (CDE) for the year
- The workers current annual Deep Dose Equivalent (DDE) dose is 0.0 Rem

Which one of the following is the maximum amount of DDE that the worker can receive for the remainder of the year, in accordance with 10 CFR 20?

- a. 2.5 Rem
- b. 3.0 Rem
- c. 8.0 Rem
- d. 13.0 Rem

QUESTION: 013 (1.00)

Which one of the following is the minimum time period requiring abstinence from alcohol, preceding any scheduled shift in accordance with 10 CFR 26, "Fitness for Duty Program?"

- a. 3 hours
- b. 5 hours
- c. 6 hours
- d. 8 hours

QUESTION: 014 (1.00)

Which one of the following events requires Shift Supervisor notification of both the on-call Manager and the NRC?

Shift Supervisor notification of both the on-call Manager and the NRC is required if:

- a. an automobile accident outside of the protected area on owner-controlled property occurs.
- b. the scram discharge volume vent valves have been failed closed for 1.5 hours.
- c. a hydraulic oil spill occurs at the circulating water intake structure.
- d. a PCB leak occurs on a transformer in the switchyard.

QUESTION: 015 (1.00)

Given the following plant conditions:

- Unit 2 is operating at 100% power
- The Shift Supervisor (SS) leaves the control room to assist the Shift Fire Commander
- It becomes necessary to activate the Plant Emergency Plan before the fire is under control

Which one of the following describes how the Site Emergency Coordinator (SEC) position is filled under these circumstances?

- a. The SS assumes the duties of the SEC and remains at the fire scene.
- b. The Shift Technical Advisor assumes the duties of SEC in the absence of the SS.
- c. The SS must turn over Shift Fire Commander duties to a Senior Auxiliary Operator and return to the control room to assume the duties of SEC.
- d. The Unit SRO assumes the duties of SEC in the absence of the SS.

QUESTION: 016 (1.00)

Which one of the following designates a Main Control Room annunciator that indicates an Emergency Operating Procedure entry condition?

- a. Red backlighting with blue bar.
- b. Red backlighting with amber bar.
- c. White backlighting with amber bar.
- d. White backlighting with blue bar.

QUESTION: 017 (1.00)

Which one of the following fire situations ALWAYS requires the Shift Supervisor to call the Brunswick County 911 Center for assistance?

- a. The fire is affecting access to, or the reliability of, safety-related plant equipment.
- b. The fire condition exists 10 minutes after a fire has been confirmed.
- c. The fire is outside the protected area but on owner-controlled property.
- d. The fire was NOT able to be immediately extinguished by the employee making the report.

QUESTION: 018 (1.00)

Which one of the following describes the function of the CRD system Equalizing Valves, F150A and F150B?

The CRD system Equalizing Valves, F150A and F150B:

- a. open to re-pressurize the exhaust water header following a scram.
- b. prevent a hydraulic lock on the CRD piston during a scram.
- c. provide a flowpath for the exhaust water during movement of a CRDM.
- d. prevent overpressurizing the CRD piston seals should the pressure control valve fail open.

QUESTION: 019 (1.00)

Which one of the following conditions will cause the reactor manual control system to generate a ROD DRIFT alarm?

- a. When an odd reed switch is made up during rod movement and the settle bus is not energized.
- b. When no even reed switch is made up and the rod is not selected and driving.
- c. Every time a control rod coupling integrity check is performed as long as the control rod is coupled to its drive mechanism.
- d. Whenever the Emergency Rod In Notch Override Switch is placed in the "EMERGENCY IN" position.

QUESTION: 020 (1.00)

During operation at 65% reactor power, a spurious electrical fault causes the "A" reactor recirculation pump discharge valve to close to the 88% open position. Assume a normal valve lineup.

Which one of the following is the automatic response of the reactor recirculation system?

- a. The "A" pump trips.
- b. Scoop tube lockup occurs on both pumps.
- c. Scoop tube lockup on the "A" pump.
- d. The "A" pump speed runs back to 28% of maximum.

QUESTION: 021 (1.00)

Which one of the following RHR pump combinations will lose its power supply if a fault occurs on 4160 Vital Bus E3?

- a. 1A/2A
- b. 1B/2B
- c. 1C/2C
- d. 1D/2D

QUESTION: 022 (1.00)

Given the following conditions on Unit 2:

- RHR "A" pump is in Shutdown Cooling (SDC)
- RHR "C" pump is under clearance
- "A" Loop RHR Heat Exchanger (HX) Bypass Valve, F048A and RHR HX Outlet Valve, F003A are throttled to control the cooldown rate

An ECCS initiation occurs from a faulty high DW pressure signal.

Which one of the following describes the automatic response of the "A" loop of RHR?

The RHR "A" pump:

- a. trips when the SD cooling suction valves close and remains tripped.
- b. trips when the SD cooling suction valves close and automatically restarts when the suppression pool suction valves open.
- c. remains running with an increase in pump flowrate due to F048A opening.
- d. remains running, pump flowrate will initially decrease as Injection Valve, F015A strokes closed, then increase as F015A automatically re-opens.

QUESTION: 023 (1.00)

The following conditions exist for Unit 1:

- Reactor water level +110 inches
- Drywell pressure +2.0 psig
- Reactor pressure 100 psig
- Alarm "HPCI VAC BRKR VLV F075/F079 NOT FULL OPEN"
- Alarm "HPCI TURB TRIP"
- Alarm "HPCI TRIP SOL ENER"

Which one of the following is the response of HPCI, if reactor pressure increases to greater than 120 psig and HPCI injection is required?

HPCI low pressure isolation:

- a. must be manually reset before HPCI will automatically inject.
- b. will automatically reset and HPCI will inject.
- c. must be manually reset and the injection valve must be manually opened.
- d. will automatically reset but Group 4 steam supply valves must be manually opened before HPCI will automatically inject.

QUESTION: 024 (1.00)

When operating HPCI for level or pressure control in accordance with the EOPs, the operator is directed to defeat the HPCI high suppression pool (SP) level suction transfer in accordance with EOP-01-SEP-10, "Circuit Alteration Procedure."

Which one of the following describes the affect this has on the HPCI suction valve logic?

The HPCI suction valves:

- a. can not be transferred manually or automatically on a CST low level signal or SP high level signal.
- b. can only be transferred manually if a CST low level signal and a SP high level signal exist.
- c. will automatically transfer if a CST low level signal exists.
- d. will automatically transfer if a SP high level signal exists.

QUESTION: 025 (1.00)

Core spray Inboard Injection Valves, F005A(B), have an associated white light, CLOSE SIG SEALED VLV F005 on P601.

Which one of the following describes the indication this light provides?

The white light indicates the:

- a. valve control switch has been turned to CLOSE with an initiation signal present.
- b. low reactor pressure, 410 psig injection permissive has not been satisfied.
- c. power supply breaker for the valve is tripped.
- d. Outboard Injection Valve, F004A(B), is open with reactor pressure above 410 psig.

QUESTION: 026 (1.00)

Which one of the following is the power supply to Core Spray Pump, 1B?

Core Spray Pump, 1B is powered from 4160V Emergency Bus:

- a. E1.
- b. E2.
- c. E3.
- d. E4.

QUESTION: 027 (1.00)

Given the following conditions on Unit 2:

- An ATWS has occurred
- Rods are being driven in using RMCS per LEP-02
- Stand by liquid control (SLC) Pump 2A is OUT-OF-SERVICE
- Reactor vessel water level is being maintained at TAF
- Reactor power is 5%.
- SLC Pump 2B is injecting
- HPCI is being used for vessel level control

There is a subsequent Loss of Off-Site Power and only DG3 starts and loads onto its respective emergency bus.

What action should be taken to continue boron injection?

- a. Inject boron with HPCI.
- b. Inject boron with RCIC.
- c. Inject boron with CRD Pump 2A.
- d. Inject boron with RWCU Pump 2A.

QUESTION: 028 (1.00)

During operation at 100% power the reactor building auxiliary operator reports the heat tracing on the suction side of the standby liquid control (SLC) pumps is damaged and inoperable.

The following conditions exist:

- Liquid poison tank concentration 15%
- Liquid poison tank volume 3500 gallons
- Reactor building ambient temperature at SLC pumps, 80 degrees F

Which one of the following actions is required based on these conditions? [Technical Specification Section 3/4.1.5 is available]

- a. Restore the SLC system to operable within 8 hours or commence an orderly reactor shutdown to be in HOT SHUTDOWN within 12 hours, because the SLC system does not meet the definition of OPERABLE.
- b. Restore the SLC system to operable within 8 hours or commence an orderly reactor shutdown to be in HOT SHUTDOWN within 12 hours, because the SLC solution temperature does not meet the requirements of Technical Specifications.
- c. Operation may be continued for up to 7 days with this condition existing.
- d. Operation may be continued indefinitely at this boron concentration as long as reactor building ambient temperature remains above 70 degrees F.

QUESTION: 029 (1.00)

The following conditions exist for Unit 2:

- The reactor has scrammed and the mode switch is in SHUTDOWN
- The problem has been identified and corrected
- Alarm "SDV HI HI LEVEL RPS TRIP" is actuated

The operator places the scram discharge volume high level scram keylock switch to BYPASS, turns the scram reset switch to both directions and then places the mode switch to STARTUP.

Which one of the following describes the expected reactor protection system response?

- a. No system response for the present plant conditions.
- b. The reactor scram will reset and remain reset.
- c. The reactor scram will reset and again scram.
- d. The reactor scram will reset when the scram discharge volume drains.

QUESTION: 030 (1.00)

Which one of the following describes the status of the RPS components, IMMEDIATELY following an inadvertent manual actuation of alternate rod insertion (ARI)?

- | | |
|----------------------------------|--------------|
| a. Scram Pilot Solenoid Valves - | De-energized |
| Backup Scram Valves - | Open |
| ARI Solenoid Valves - | De-energized |
| b. Scram Pilot Solenoid Valves - | Energized |
| Backup Scram Valves - | Closed |
| ARI Solenoid Valves - | De-energized |
| c. Scram Pilot Solenoid Valves - | De-energized |
| Backup Scram Valves - | Open |
| ARI Solenoid Valves - | Energized |
| d. Scram Pilot Solenoid Valves - | Energized |
| Backup Scram Valves - | Closed |
| ARI Solenoid Valves - | Energized |

QUESTION: 031 (1.00)

A reactor startup is in progress with IRMs on Range 2. While withdrawing SRM detectors, the operator inadvertently selects IRM detector E drive unit.

Which one of the following describes the effect this has on the IRM system?

- a. IRM E detector will NOT withdraw because companion APRM E is downscale.
- b. IRM E detector will withdraw and "IRM A UPSCALE/INOP" annunciator will be received.
- c. IRM E will withdraw and a control rod block will be generated when the detector begins to withdraw.
- d. No action occurs because the range selector switch for IRM E is on Range 2 and the mode switch is not in "RUN."

QUESTION: 032 (1.00)

Given the following plant conditions:

- Reactor startup is in progress
- Range switches for IRM's A, C, E, are on Range 3
- IRM G is bypassed.

Which one of the following describes the status of the SRM division "A" rod blocks?

- a. No SRM division "A" rod blocks are bypassed.
- b. Only the SRM downscale is bypassed.
- c. Both SRM INOP and downscale are bypassed.
- d. Both SRM downscale and detector not full in are bypassed.

QUESTION: 033 (1.00)

During a reactor startup the SRM system loses monitoring capability and a rod block is received.

Which one of the following power sources has been lost?

- a. 24 Volt DC
- b. 120 VAC Emergency Power
- c. RPS Power System
- d. 120 VAC UPS

QUESTION: 034 (1.00)

Which one of the following is the maximum number of LPRMs that can have their function switch out of OPERATE for APRM channel "D," without generating a "APRM UPSCL TRIP/INOP SYS B" annunciator?

- a. 3
- b. 4
- c. 6
- d. 7

QUESTION: 035 (1.00)

With Unit 1 operating at 100% power, APRM channel "C" has the following LPRMS bypassed:

04-37B 36-05B 12-29C 04-21D 28-29A

With these conditions LPRM 20-05D fails downscale.

Which one of the following is required, assuming no other APRMs are inoperable? [(A listing of LPRM detectors included in APRM channels is available.)]

- a. No action is required, continue operation with no restrictions.
- b. Bypass LPRM 20-05D and continue operation with no restrictions.
- c. Bypass LPRM 20-05D and declare APRM channel "C" inoperable.
- d. Bypass LPRM 20-05D, declare APRM channel "C" inoperable and insert a trip on RPS channel "A."

QUESTION: 036 (1.00)

Which one of the following describes the function of the reference leg backfill system?

- a. Prevent flashing of the reference leg during rapid depressurization below 400 psig by providing cooling water to the reference leg.
- b. Ensure the reference leg remains full.
- c. Prevent erroneous low water level indication during a major steam leak.
- d. Prevent migration of non-condensable gases into the reference leg by increasing reference leg spillover.

QUESTION: 037 (1.00)

While restoring the RCIC system to standby status following an automatic initiation per OP-16, "RCIC System Operating Procedure," the operator inadvertently depresses the STEAM ISOLATION manual pushbutton instead of the TURBINE TRIP pushbutton.

Which one of the following describes the response of the RCIC Steam Supply Inboard Isolation Valve, E51-F007 and RCIC Steam Supply Outboard Isolation Valve, E51-F008?

- a. Only the Steam Supply Inboard Isolation Valve, E51-F007, closes.
- b. Only the Steam Supply Outboard Isolation Valve, E51-F008, closes.
- c. Both the Steam Supply Inboard Isolation Valve, E51-F007, and the Steam Supply Outboard Isolation Valve, E51-F008, close.
- d. NEITHER the Steam Supply Inboard Isolation Valve, E51-F007, or the Steam Supply Outboard Isolation Valve, E51-F008, close.

QUESTION: 038 (1.00)

Which one of the following describes the automatic alignment of the ADS pneumatic supply with a LOCA signal present?

The ADS pneumatic supply automatically aligns to the:

- a. pneumatic nitrogen system (PNS) backed up by reactor building noninterruptible air (RNA) system.
- b. PNS backed up by backup nitrogen system.
- c. backup nitrogen system.
- d. RNA system.

QUESTION: 039 (1.00)

Given the following reactor vessel level inputs to the digital feedwater control system (DFCS):

- LT-N004A 183 inches
- LT-N004B 190 inches
- LT-N004C 188 inches
- Level select switch on P-603 selected to "A"

Which one of the following will be the selected level input of the DFCS?

- a. 183 inches
- b. 187 inches
- c. 188 inches
- d. 190 inches

QUESTION: 040 (1.00)

Which one of the following will automatically remove the "3 element permissive" from the digital feedwater control system?

- a. Reactor vessel level instrument out of tolerance
- b. Reactor feed pump control signal failure
- c. Steam flow and feed flow decrease to less than 20% of total.
- d. Reactor Scram

QUESTION: 041 (1.00)

During operation at 100% power, RPS Motor Generator Set "A" trips.

Which one of the following describes the affect this has on the Standby Gas Treatment (SBGT) system?

- a. SBGT train "A" must be declared inoperable.
- b. Only the SBGT train selected with the "SBGT A(B) PREF" control switch on RTGB XU-51 will start.
- c. Neither SBGT train will automatically start.
- d. Both SBGT trains will automatically start.

QUESTION: 042 (1.00)

Diesel Generator (DG) 3 tripped on high lube oil temperature while operating in LOCAL MANUAL. With DG3 in this condition, the master/slave breaker from 2D to E3 trips open.

Which one of the following describes the expected response of DG3?

DG3 will:

- a. start and energize bus E3.
- b. start and trip after 45 seconds.
- c. not start due to local manual status.
- d. not start until the lockout is manually reset.

QUESTION: 043 (1.00)

A plant shutdown is in progress. The last control rod from step 6B has been inserted and another control rod has been selected.

The RWM display indicates:

| | | |
|----------------------------|----------------------|------------------|
| SELF TEST:OK | SEQUENCE: B2X BPWS 3 | MODE:OPERATE |
| BLOCKS: INSERT WITHDRAW | STEP: 6B | POWER:BELOW LPSP |
| SR 30 -- 07 : 00 | | SE IB WB |
| IE 06 -- 39 : 14 | | B2X--6B |
| HELP | DISPLAY OFF | ETC |

What action should be taken to clear ALL existing RWM blocks?

- Select any control rod from Rod Sequence Checkoff Sheet, step 6B.
- Select any control rod from Rod Sequence Checkoff Sheet, step 6A.
- Select and withdraw control rod 06-39 to position 16.
- Withdraw control rod 30-07 to position 04.

QUESTION: 044 (1.00)

Which one of the following describes how the recirculation jet pump design provides core reflood capability?

- All ECCS flow entering the core must flow through the jet pumps.
- The height of the jet pump throat inlets are at 2/3 active core height.
- All flow leaving the active core area during a design basis accident must flow through the jet pumps.
- Leakage at the jet pump mixer/diffuser joint is less than the capacity of two LPCI pumps.

QUESTION: 045 (1.00)

Which one of the following would be an indication of a reactor water cleanup (RWCU) resin injection into the reactor coolant system?

A RWCU resin injection into the reactor coolant system will cause:

- a. a significant increase in reactor coolant conductivity.
- b. a decrease in differential pressure across the RWCU filter demineralizer.
- c. an increase in RWCU flow.
- d. a significant increase in reactor coolant iodine.

QUESTION: 046 (1.00)

During cooldown and depressurization of the reactor coolant system, a target cooldown rate of 25 degrees F/hour is recommended.

Which one of the following is the basis for this recommendation?

The target cooldown rate:

- a. provides sufficient margin to prevent exceeding the Technical Specification cooldown limit.
- b. minimizes thermal shock to the LPCI injection nozzles.
- c. minimizes release of corrosion product activity during cooldown.
- d. prevents exceeding the heat removal capacity of the service water system.

QUESTION: 047 (1.00)

Given the following conditions:

- A reactor startup is in progress on Unit 2
- Control rod withdrawals are in progress
- Reactor power is low in the intermediate range
- Control rod 30-31 is currently selected for withdrawal from notch 42 to 44

Following rod withdrawal, which one of the following would indicate that a failure of the rod position indication system (RPIS) reed switch input to the RWM at notch 44 has occurred?

- a. Control rod 30-31 cannot be withdrawn.
- b. A control rod select block is in.
- c. A control rod drift alarm is in on rod 30-31.
- d. The RWM will indicate 30 -- 31:FF POS TO SUB 44.

QUESTION: 048 (1.00)

Given the following conditions:

- Unit 2 is at 40% power
- APRM "D" fails "Downscale"
- NO operator actions have been taken

Which one of the following describes the automatic response of the Rod Block Monitor (RBM) system? (Consider only the effect of the RBM system.)

RBM channel "B":

- a. enforces the high trip setpoint (HTSP).
- b. automatically shifts to APRM "F".
- c. sends a rod withdrawal block to RMCS.
- d. rod block logic is bypassed.

QUESTION: 049 (1.00)

After a design basis LOCA, suppression pool cooling is placed in service to limit the temperature to less than 170 degrees F.

Which one of the following describes the basis for this temperature limit?

A temperature limit of 170 degrees F:

- a. prevents violating the vortex limits for the ECCS pumps.
- b. prevents damage to the ECCS pump seals
- c. facilitates complete condensation of the blowdown steam
- d. is the maximum temperature at which SBT can take a suction on the suppression pool.

QUESTION: 050 (1.00)

Which one of the following are the suppression chamber pressures, at which the initiation and termination of suppression pool sprays is required?

INITIATION

- a. After Exceeding 13 psig
- b. After Exceeding 13 psig
- c. Before Exceeding 13 psig
- d. Before Exceeding 13 psig

TERMINATION

- Before Decreasing Below 2.5 psig
- Before Decreasing Below 2.7 psig
- After Decreasing Below 2.7 psig
- After Decreasing Below 2.5 psig

QUESTION: 051 (1.00)

Which one of the following are the power supplies to the two solenoids associated with each main steam isolation valve (MSIV)?

| INBOARD MSIVs ----- | OUTBOARD MSIVs ----- |
|-------------------------------|----------------------------|
| a. 125 VDC "A" RPS "A" | 125 VDC "B" RPS "B" |
| b. 125 VDC "B" RPS "B" | 125 VDC "A" RPS "A" |
| c. 125 VDC "A" 125 VDC "B" | RPS "A" RPS "B" |
| d. RPS "A" RPS "B" | 125 VDC "A" 125 VDC "B" |

QUESTION: 052 (1.00)

During operation at 100% power a sudden complete loss of EHC occurs.

Which one of the following is the expected response of the turbine and associated support systems?

- a. Turbine stop and control valves fail closed on low EHC pressure, turbine control valve fast closure actuates RPS trip, bypass valves function for approximately 60 seconds then fail closed.
- b. Turbine trip on overspeed, turbine stop valves < 90% open actuates RPS trip, bypass valves fail closed.
- c. Turbine trip on low EHC pressure, turbine stop valves < 90% open actuates RPS trip, bypass valves function for approximately 60 seconds then fail closed.
- d. Turbine trip on low EHC pressure, turbine stop valves < 90% open actuates RPS trip, bypass valves fail closed.

QUESTION: 053 (1.00)

Which one of the following is the normal suction source for the control rod drive pumps during operation at 100% power?

- a. Main condenser hotwell.
- b. Discharge of condensate pumps prior to the steam packing exhauster.
- c. Direct from condensate storage tank (CST).
- d. Hotwell reject to CST line.

QUESTION: 054 (1.00)

A Unit 2 4160V AC breaker has been racked in following maintenance on its associated pump. The operator racking in the breaker installed the control power fuses but failed to position the breaker toggle switch to the "ON" position.

Which one of the following is the affect on breaker operability?

The breaker will have:

- a. normal control room indications but no remote operation will be possible.
- b. normal control room indications but can be only be closed by local pushbutton.
- c. no control room indications and cannot be operated by the remote controls.
- d. no control room indications but may be closed with the local pushbutton.

QUESTION: 055 (1.00)

During operation at 100% power, Augmented Off-Gas (AOG) system annunciator, APP UA-39 2-2, DISCHARGE H2 CONC HIGH is received.

Which one of the following is the first automatic action that results from this condition.

- a. Isolation and bypass of the AOG system after a 30 second time delay.
- b. Immediate actuation of the AOG process timer.
- c. AOG Bypass Valve, HCV-102 and Filter House Loop Seal Reservoir Drain Valve, SV-4907 close after a 15 minute time delay.
- d. Recombiner strip heaters immediately energize.

QUESTION: 056 (1.00)

Which one of the following describes the traversing in core probe (TIP) detector.

- a. Gamma-sensitive ion chamber coated with Uranium.
- b. Gamma-sensitive ion chamber without Uranium coating.
- c. NON-gamma compensated fission chamber
- d. Gamma compensated fission chamber

QUESTION: 057 (1.00)

Which one of the following Rad Waste components will automatically shift to a cooling recirculation mode if a high temperature is sensed.

- a. Drywell floor drain sump.
- b. Reactor building floor drain sump.
- c. Turbine building equipment drain sump.
- d. Reactor building equipment drain tank.

QUESTION: 058 (1.00)

Which one of the following describes why EOP-01, "Level Power Control" directs the operator to inhibit ADS?

Inhibiting ADS:

- a. prevents discharging boron to the suppression pool via the SRVs.
- b. ensures RPV pressure remains high enough to scram control rods.
- c. ensures adequate natural circulation is retained for boron mixing.
- d. prevents the power excursion from an uncontrolled coolant injection.

QUESTION: 059 (1.00)

During a Unit 2 startup, a loss of extraction steam resulted in the following conditions:

- Reactor power 60%
- Core flow 30 mlbs/hr
- Core plate d/p 6.0 psid
- Generator output 425 MWe

Which one of the following is the required action? [Figure 1, Thermal Power Limitations is available.]

- a. Initiate Select Rod Insert
- b. Manually scram the reactor
- c. Raise core flow above 35 mlbs/hr
- d. Commence a normal reactor shutdown

QUESTION: 060 (1.00)

Following a loss of the Unit 2 startup auxiliary transformer (SAT), the following plant conditions exist:

- Unit 1 buses powered by Unit 1 SAT
- DG 1, 2 and 4 running
- DG 3 tripped and cannot be started
- Bus E3 energized from Bus E1, with local selector in "MAINT"
- Unit 2 HOT SHUTDOWN at 400 psig.

Which one of the following will cause the Bus E1 to Bus E3 cross-tie breakers (AG0 at E1, AJ5 at E3) to trip?

- a. Their local control switches are placed to TRIP.
- b. Their local selector switches are placed to NORM.
- c. DG 1 trip and lock out on low lube oil pressure.
- d. Unit 2 drywell pressure greater than 2.0 psig.

QUESTION: 061 (1.00)

A Loss Of Coolant Accident (LOCA) concurrent with a Loss Of Off Site Power and failure of DG 4 to start occurred on Unit 2 at 3:00 pm. At 3:08 pm the Shift supervisor directed the operator to place the Bus E2 to Bus E4 crosstie breaker control switch in "MAINT."

Which one of the following describes the operation of the Bus E2 to Bus E4 crosstie breakers with these conditions?

The Bus E2 to Bus E4 crosstie breakers may:

- a. be closed ten minutes after the LOCA signal (3:10 pm).
- b. be closed ten minutes after the control switch is placed in "MAINT" (3:18 pm).
- c. not be closed unless the control switch is placed in either the "SBO" or "Fire" positions.
- d. not be closed in accordance with current plant procedures.

QUESTION: 062 (1.00)

Given the following conditions on Unit 2:

- Reactor has scrammed following a complete loss of circulating water
- RCIC injecting at 400 gpm
- HPCI and CRD are unavailable
- Reactor water level dropped to +30 inches but is currently +100 inches and rising
- No indications of fuel failure
- Suppression pool level -2 feet
- Suppression pool temperature 105 degrees F and steady
- Reactor pressure 990 psig and slowly rising

Which one of the following describes how reactor pressure should be stabilized below 1025 psig with these conditions?

- a. Establish RCIC in the pressure control mode.
- b. Open SRVs as necessary.
- c. Open the MSIVs and stabilize pressure using the bypass valves.
- d. Open the main steam line drains.

QUESTION: 063 (1.00)

Following a reactor scram on Unit 2 the operator can NOT determine that reactor power is less than 3%.

Which one of the following immediate operator actions for a reactor scram is ONLY performed on Unit 2?

- a. VERIFY or PLACE the Feedwater/Level Controller setpoint to +170 inches.
- b. WHEN reactor power is below the APRM downscale setpoint, TRIP the Main Turbine.
- c. When steam flow is less than 3 million lb/hr, PLACE the Reactor MODE Switch to SHUTDOWN.
- d. WHEN Reactor Vessel level is above + 170 inches AND increasing, IF two Reactor Feed Pumps are running, THEN trip one.

QUESTION: 064 (1.00)

After entering EOP-01-AEDP, "Alternate Emergency Depressurization Procedure," the Shift Supervisor has directed bypassing the Group 1 isolation to open the MSIV's to accomplish depressurization.

Which one of the following is EOP-01-AEDP guidance, with respect to opening the MSIV's?

- a. The MSIV's should NOT be opened if a main steam line break is suspected.
- b. The MSIV's should NOT be opened if the RPV cooldown rate will be exceeded.
- c. Open the MSIV's only if the main steam radiation monitors are operable.
- d. Open the MSIV's irrespective of suspected fuel failure or main steam line break.

QUESTION: 065 (1.00)

Which one of the following is the purpose of the 45% demand, recirculation flow control speed limiter #2?

Speed limiter #2:

- a. prevents running the recirculation pump at high speed with the discharge valve only partially open.
- b. provides NPSH protection for the recirculation jet pumps at low feedwater flow.
- c. limits reactor power so that the feedwater system will be able to maintain or recover reactor water level on loss of a reactor feed pump.
- d. limits recirculation flow such that possible operation in the areas of instability is reduced.

QUESTION: 066 (1.00)

During operation at 100% power a gross failure of both seals on recirculation pump "B" occurs.

Which one of the following is the amount and type of drywell leakage?

- a. 55-65 gpm of Unidentified leakage
- b. 55-65 gpm of Identified leakage
- c. 110-130 gpm of Unidentified leakage
- d. 110-130 gpm of Identified leakage

QUESTION: 067 (1.00)

When controlling primary containment pressure below 1.8 psig, EOP-02 "Primary Containment Control Procedure," directs the operator to "VENT THE DRYWELL USING SBGT (OP-10) AS REQUIRED."

Which one of the following describes the vent flowpath specified in OP-10?

- a. Suppression chamber via the 2 inch line utilizing the 1/2 inch post LOCA inlets to SBGT.
- b. Suppression chamber via the 20 inch line utilizing the normal inlet (F) damper to SBGT.
- c. Drywell via the 18 inch line utilizing the normal inlet (F) damper to SBGT.
- d. Drywell through the 2 inch bypass line and suppression chamber through the 2 inch line, utilizing the normal inlet (F) damper to SBGT.

QUESTION: 068 (1.00)

Unit 1 is operating at 75% power with the following conditions:

- Suppression pool water temperature is 85 degrees F with one loop of suppression pool cooling in service
- Safety relief valve (SRV) operability surveillance is in progress
- Following operation of SRV "L," there is indication that it is stuck open

Which one of the following criteria requires the operator to manually scram the reactor.

- a. Suppression pool temperature continues to increase with all available cooling in service.
- b. As soon as it is recognized the SRV will not close.
- c. The safety relief valve has been open for 2 minutes.
- d. Suppression pool average water temperature increases to 105 degrees F.

QUESTION: 069 (1.00)

EOP-02, "Primary Containment Control Procedure questions:" "CAN THE HEAT CAPACITY TEMP LIMIT BE MAINTAINED IN THE SAFE REGION?"

Which one of the following are the two plant conditions that must be evaluated to make this determination?

- a. Suppression pool temperature and reactor pressure.
- b. Suppression pool temperature and suppression pool level.
- c. Suppression pool level and delta T heat capacity.
- d. Suppression pool level and suppression chamber pressure.

QUESTION: 070 (1.00)

Which one of the following initial plant conditions would result in the worst case, rod drop accident?

- a. Between 10% and 25% reactor power.
- b. Between 29% and 64% reactor power.
- c. Between 50% rod density and 10% reactor power.
- d. Less than 50% rod density.

QUESTION: 071 (1.00)

Following a reactor scram, two control rods are at notch 04 and two others are at notch 12.

Which one of the following methods is NOT allowed by EOP-01-LEP-02, "Alternate Control Rod Insertion" to insert these rods?

- a. Scram individual rods with scram test switches.
- b. Pull fuses to de-energize all scram pilot valves.
- c. Raise drive water differential pressure and insert rods with RMCS.
- d. Vent the overpiston area of the control rods.

QUESTION: 072 (1.00)

Following an incomplete reactor scram the Shift Supervisor has entered EOP-01-LEP-02, "Alternate Control Rod Insertion" to insert rods.

Which one of the following alternate rod insertion methods require a reset of the reactor protection system?

Control rod insertion by:

- a. de-energizing the scram pilot valve solenoids.
- b. venting the scram air header.
- c. using the reactor manual control system.
- d. increasing cooling water header pressure.

QUESTION: 073 (1.00)

The control room has been evacuated because of a chlorine incident.

Which one of the following describes who assumes the duties of Site Emergency Coordinator and where he reports to after evacuating the control room?

- a. Unit 1 Shift Supervisor - Unit 1 Remote Shutdown panel
- b. Unit 1 Shift Supervisor - Technical Support Center
- c. Unit 2 Shift Supervisor - Unit 2 Remote Shutdown panel
- d. Unit 2 Shift Supervisor - Technical Support Center

QUESTION: 074 (1.00)

AOP-32.0, "Plant Shutdown From Outside Control Room," cautions the operator to minimize throttling actions on DC motor-operated valves.

Which one of the following describes the reason for this caution?

Throttling actions on DC motor-operated valves should be minimized to:

- a. prevent exceeding the duty cycle on the motors.
- b. prevent excessive drain on the vital batteries.
- c. limit valve wear from throttling actions.
- d. limit electrical arcing in an explosive gas atmosphere, which may be present.

QUESTION: 075 (1.00)

Given the following plant conditions:

- Reactor has been shutdown for 24 hours
- Control rod 13-12 indicates notch "00" but does not indicate a full in, green light
- SRMs A and C are reading 2 cps
- SRMs B and D are reading 5 and 8 counts respectively
- Fuel pool level is 23 feet 2 inches above the fuel assemblies seated in the spent fuel storage rack

With the above conditions which one of the following would prevent removal of spent fuel from the reactor core, either procedurally or because of a refueling interlock?

- a. The level of water above the fuel assemblies when seated in the spent fuel storage rack is not high enough.
- b. The required number of SRM channels are not available per Technical Specifications.
- c. The failure of rod 13-12 to generate a rod full in signal to RMCS.
- d. The required time before spent fuel can be removed from the reactor core has not elapsed.

QUESTION: 076 (1.00)

Given the following plant conditions on Unit 2:

- Refueling operations are in progress
- A spent fuel bundle is dropped and damaged
- AREA RAD REFUEL FLOOR HIGH annunciator is alarming

Which one of the following is a required immediate operator action?

- a. Start the standby gas treatment system.
- b. Order evacuation of the Reactor Building.
- c. Isolate Reactor Building ventilation.
- d. Order all fuel movement stopped.

QUESTION: 077 (1.00)

EOP-01-SEP-01, "Primary Containment Venting," directs venting of primary containment via the suppression chamber, if drywell pressure cannot be maintained below 70 psig, or hydrogen concentration reaches 1%.

Which one of the following is the reason that this path is the preferred method to vent the primary containment under these conditions?

Venting from the suppression chamber:

- a. condenses any steam from the primary containment.
- b. prevents excessive drywell-to-torus differential pressure.
- c. utilizes the scrubbing action of the torus to remove iodine.
- d. dilutes the explosive hydrogen concentration.

QUESTION: 078 (1.00)

During the execution of EOP-02, "Primary Containment Control," you reach the decision step, "DRYWELL SPRAY INITIATION LIMIT IN SAFE REGION."

Which one of the following is the safety significance of the drywell spray initiation limit?

- a. Due to convective cooling the pressure reduction is too fast for the primary containment internal vacuum relief system to ensure primary containment integrity.
- b. Convective cooling does not have enough pressure suppression capability to suppress primary containment pressure during design basis LOCA events.
- c. Due to evaporative cooling the pressure reduction is too fast for the primary containment internal vacuum relief system to ensure primary containment integrity.
- d. Evaporative cooling does not have enough pressure suppression capability to suppress primary containment pressure during design basis LOCA events.

QUESTION: 079 (1.00)

Which one of the core thermal limits will be affected the most by an ATWS transient resulting in a high reactor pressure (>1120 psig)?

- a. Minimum Critical Power Ratio
- b. Average Planar Linear Heat Generation Rate
- c. Maximum Average Planar Linear Heat Generation Rate Ratio
- d. Maximum Fraction of Limiting Power Density

QUESTION: 080 (1.00)

At the end of a Unit 2 operating cycle with the plant in coastdown and all rods out, a transient results in a peak reactor pressure of 1130 psig for 5 seconds.

Which one of the following describes the affect the ATWS-RPT will have on the reactor recirculation pumps?

The ATWS-RPT will:

- a. not actuate unless RPV LL No. 2 is present at the same time.
- b. actuate and trip the recirculation MG set drive motor breaker.
- c. actuate and trip the recirculation MG set field breaker
- d. actuate and trip the two breakers installed in series between the generator and the recirculation pump motor.

QUESTION: 081 (1.00)

In accordance with Technical Specifications, the reactor was depressurized due to suppression pool temperature being greater than 120 degrees F.

Which one of the following conditions must be met in order to restart the reactor? [NOTE: Technical Specification 3.0.4 is applicable]

Suppression pool temperature must be less than or equal to:

- a. 95 degrees F before changing operational modes.
- b. 105 prior to reopening the MSIVs.
- c. 110 degrees F prior to exceeding 1% power.
- d. 120 degrees F for 24 hours.

QUESTION: 082 (1.00)

Which one of the following is the basis for the primary containment average temperature Limiting Condition for Operation (LCO).

The primary containment average temperature LCO is based on:

- a. minimizing temperature related failures of mechanical equipment in the containment.
- b. limiting peak temperatures to less than the design temperature during a loss of coolant accident.
- c. minimizing the differential temperature across the drywell coolers to prevent fan damage.
- d. minimizing the temperature correction required for the reactor vessel level instruments.

QUESTION: 083 (1.00)

EOP-02, "Primary Containment Control Procedure", Step SP/L-31 directs, "SECURE HPCI IRRESPECTIVE OF ADEQUATE CORE COOLING," if suppression pool level cannot be maintained above -6.5 feet.

Which one of the following describes the operation of RCIC when suppression pool level cannot be maintained above -6.5 feet?

- a. RCIC will be tripped and isolated at the same time the EOP-02 directs the securing of HPCI.
- b. RCIC will be secured manually prior to HPCI due to erratic turbine operation as exhaust backpressure increases.
- c. RCIC operation may continue only if it is the last operable high pressure injection system available to provide adequate core cooling.
- d. RCIC operation may continue as the turbine exhaust energy does not contribute excessively to increasing containment pressure.

QUESTION: 084 (1.00)

During operation at 80% power on Unit 2, the "A" Reactor Recirculation Pump trips.

The following plant conditions exist following the pump trip:

- The reactor is in region B on the thermal power limitations map
- Multiple LPRM upscale/downscale alarms are periodically annunciating and clearing
- APRM power oscillations are 6% peak to peak on two channels and 7% on four channels

Which one of the following is an immediate operator action with these conditions?

- a. Increase core flow to greater than 35 mlbs/hr using the "B" reactor recirculation pump.
- b. Decrease core flow to less than 35 mlbs/hr using the "B" reactor recirculation pump.
- c. Reduce reactor power to a level compatible with core flow by inserting control rods.
- d. Insert a manual reactor scram.

QUESTION: 085 (1.00)

Which one of the following is an indication of a jet pump failure during operation at 100% power?

- a. Decrease in indicated total core flow.
- b. Core plate differential pressure decrease.
- c. Recirculation loop flow decrease in the loop with the failed jet pump.
- d. Recirculation pump discharge pressure increase on the loop with the failed jet pump.

QUESTION: 086 (1.00)

Following a loss of main condenser vacuum the bypass valves are being used to lower reactor pressure.

Which one of the following vacuum readings corresponds to the lowest value at which the bypass valves will still be effective in reducing reactor pressure? (Consider ONLY actual plant setpoints per AOP-37.0 for your answer)

- a. 19 inches Hg
- b. 10 inches Hg
- c. 7 inches Hg
- d. 0 inches Hg

QUESTION: 087 (1.00)

Which one of the following describes the function of the low condenser vacuum bypass switches?

- a. Bypass the low vacuum turbine trip while reducing generator output following loss of a circulating water pump.
- b. Bypass the bypass valve low vacuum closure, during ATWS conditions.
- c. Allow operation of the mechanical vacuum pump during a loss of condenser vacuum transient.
- d. Allow operation of the steam seals when establishing initial condenser vacuum using the mechanical vacuum pump.

QUESTION: 088 (1.00)

Which one of the following describes the operational impact a loss of 125V DC control power has on a 4160V AC breaker?

A 4160V AC breaker that has lost control power will:

- a. not trip on a fault and can not be tripped from the control room.
- b. not trip on a fault but can be tripped from the control room.
- c. trip on a fault but can not be tripped from the control room.
- d. trip on a fault and can be tripped from the control room.

QUESTION: 089 (1.00)

Given the following plant conditions:

- Reactor has scrammed
- RCIC is operating maintaining vessel level
- HPCI was secured by the operator

Which one of the following describes the affect a loss of Division I, 125V DC will have on RCIC?

Following a loss of Division I 125V DC, the RCIC:

- a. Turbine Steam Supply Valve, (E51-F045) will not close on a high vessel level condition.
- b. turbine will trip on overspeed.
- c. turbine speed will decrease to approximately 2000 RPM.
- d. system inboard isolation logic will actuate.

QUESTION: 090 (1.00)

Which one of the following describes why EOP-01-RSP, "Reactor Scram Procedure," directs the operator to "TRIP TURBINE" instead of letting it trip automatically on reverse power?

The automatic reverse power trip:

- a. will result in excessive arcing in the main generator output breakers.
- b. may cause a pressure spike sufficient to rupture the LP turbine relief diaphragms.
- c. will result in an automatic cold start of the diesel generators.
- d. may place an unnecessary load on the main turbine thrust bearing.

QUESTION: 091 (1.00)

Which one of the following limits the rate at which reactor vessel level can be lowered using reactor water cleanup reject at rated temperature and pressure.

- a. Regenerative heat exchanger cooldown rate.
- b. Nonregenerative heat exchanger outlet temperature.
- c. Temperature change limit in the reactor vessel drain line.
- d. Pressure downstream of reject Flow Control Valve, G33-F033.

QUESTION: 092 (1.00)

Which one of the following cooling water system conditions requires a manual reactor scram if pressure cannot be immediately restored?

- a. Conventional Service Water pressure is steady at 36 psig with one TBCCW Service Water Supply Valve (SW-V4) in its throttled position.
- b. Nuclear Service Water pressure is 25 psig and decreasing and Diesel Generator Building service water header was left isolated.
- c. All Turbine Building Closed Cooling Water system pumps are running and pressure is 45 psig.
- d. All Reactor Building Closed Cooling Water system pumps are running and pressure is 65 psig and decreasing.

QUESTION: 093 (1.00)

Given the following plant conditions:

- A loss of off-site power has occurred
- RBCCW PUMP DISCH HDR PRESS LOW annunciator is alarming
- Discharge header pressure indicates 30 psig

Which one of the following describes the automatic restart feature(s) of the RBCCW pumps as the diesel generators energize the E buses.

The RBCCW pumps will:

- a. start only if their control switch is in AUTO.
- b. start only if their control switch is in ON.
- c. start if their control switch is in AUTO or ON.
- d. not restart unless their control switch is placed to OFF then to AUTO or ON.

QUESTION: 094 (2.00)

Match the pneumatic (air/nitrogen) system failure automatic actions from Column A with the actuation pressure listed in Column B.

The items from column B may be used once, more than once, or not at all and only a single answer may occupy one answer space.

| COLUMN A AUTOMATIC ACTIONS ----- | COLUMN B ACTUATION PRESSURE ----- |
|---|---|
| a. Air Compressors A, B and C start | 1. 85 psig |
| b. Service Air Isolation Valves, PV-706-1 and PV-706-2 close | 2. 95 psig |
| c. Standby Reactor Building Air Compressors start | 3. 100 psig |
| d. Backup Nitrogen Rack Isolation Valves, RNA-SV-5481 and RNA-SV-5482 open | 4. 105 psig |
| | 5. 107 psig |
| | 6. 109 psig |
| | 7. 110.5 psig |

QUESTION: 095 (1.00)

Which one of the following pairs of Group 1 isolation signals will cause the Recirculation Sample Valves, B32-F019 and B32-F020 to close?

- a. Reactor Low Level #3, Main Steam Line High Flow
- b. Condenser Vacuum, Main Steam Line Low Pressure
- c. Turbine Building Area Temperature High, Main Steam Line Tunnel Temperature High
- d. Reactor Low Level #3, Main Steam Line High Radiation

QUESTION: 096 (1.00)

Given the following plant conditions:

- A loss of both CRD pumps has occurred
- Several control rods temperatures are exceeding 350 degrees F

Which one of the following is the greatest concern, when a control rod temperature exceeds 350 degrees F?

This control rod temperature may:

- a. result in a measurable delay in the scram time response.
- b. increase the scram response time to the point of causing severe damage to the control rod mechanism.
- c. cause thermal shock cracking of the control rod housing if scrammed.
- d. result in gas binding of the piston area which will inhibit movement.

QUESTION: 097 (1.00)

Unit 2 was operating at 100% power when a LOCA occurred.

The following plant conditions exist:

- Drywell reference leg area temperature is 375 degrees F
- Drywell pressure is 5 psig
- Reactor pressure is 100 psig

Which one of the following reactor water level instruments would indicate a valid level? [Caution 1, Reactor Water Level is available]

- a. Fuel zone (N036/37) with a reading of greater than +150 inches
- b. Narrow range (N004A/B/C) with a reading of +152 inches
- c. Wide range (N026A/B) with a reading of +152 inches
- d. Shutdown range (N027A/B) with a reading of +152 inches

QUESTION: 098 (1.00)

Which one of the following indications is used to monitor plant heatup/cooldown rate while in Alternate Shutdown Cooling with the SRVs?

- a. Recirculation loop suction line temperature.
- b. Steam dome pressure using steam table conversions.
- c. Safety relief valve tailpipe temperature.
- d. The running ECCS pump local suction temperature.

QUESTION: 099 (1.00)

Which one of the following is the definition of the SRV TAIL PIPE LEVEL LIMIT?

It is the highest suppression pool water level at which the opening of an SRV will NOT result in damage to the:

- a. ring header.
- b. ring header downcomers.
- c. "T" quencher supports.
- d. SRV tail pipe vacuum breakers.

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

S R O E x a m B W R R e a c t o r
O r g a n i z e d b y Q u e s t i o n N u m b e r

| <u>QUESTION</u> | <u>VALUE</u> | <u>REFERENCE</u> |
|-----------------|--------------|------------------|
| 001 | 1.00 | 9001010 |
| 002 | 1.00 | 9001012 |
| 003 | 1.00 | 9001013 |
| 004 | 1.00 | 9001014 |
| 005 | 1.00 | 9001015 |
| 006 | 1.00 | 9001016 |
| 007 | 1.00 | 20126 |
| 008 | 1.00 | 9001020 |
| 009 | 1.00 | 9001021 |
| 010 | 1.00 | 9001022 |
| 011 | 1.00 | 9001023 |
| 012 | 1.00 | 9001024 |
| 013 | 1.00 | 9001025 |
| 014 | 1.00 | 9001026 |
| 015 | 1.00 | 9001027 |
| 016 | 1.00 | 9001028 |
| 017 | 1.00 | 9001029 |
| 018 | 1.00 | 9001032 |
| 019 | 1.00 | 9001034 |
| 020 | 1.00 | 15478 |
| 021 | 1.00 | 9001037 |
| 022 | 1.00 | 9001038 |
| 023 | 1.00 | 20144 |
| 024 | 1.00 | 9001042 |
| 025 | 1.00 | 9001044 |
| 026 | 1.00 | 9001045 |
| 027 | 1.00 | 9001046 |
| 028 | 1.00 | 9001047 |
| 029 | 1.00 | 22041 |
| 030 | 1.00 | 9001049 |
| 031 | 1.00 | 9001050 |
| 032 | 1.00 | 9001051 |
| 033 | 1.00 | 25102 |
| 034 | 1.00 | 9001053 |
| 035 | 1.00 | 9001054 |
| 036 | 1.00 | 9001055 |
| 037 | 1.00 | 9001056 |
| 038 | 1.00 | 9001058 |
| 039 | 1.00 | 9001059 |
| 040 | 1.00 | 9001060 |
| 041 | 1.00 | 9001061 |
| 042 | 1.00 | 9001062 |
| 043 | 1.00 | 9001065 |
| 044 | 1.00 | 9001067 |
| 045 | 1.00 | 9001068 |
| 046 | 1.00 | 9001071 |
| 047 | 1.00 | 9001072 |
| 048 | 1.00 | 9001074 |
| 049 | 1.00 | 9001077 |

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S R O E x a m B W R R e a c t o r
O r g a n i z e d b y Q u e s t i o n N u m b e r

| <u>QUESTION</u> | <u>VALUE</u> | <u>REFERENCE</u> |
|-----------------|--------------|------------------|
| 050 | 1.00 | 9001078 |
| 051 | 1.00 | 9001080 |
| 052 | 1.00 | 9001081 |
| 053 | 1.00 | 9001082 |
| 054 | 1.00 | 22073 |
| 055 | 1.00 | 9001084 |
| 056 | 1.00 | 9001085 |
| 057 | 1.00 | 9001089 |
| 058 | 1.00 | 9001092 |
| 059 | 1.00 | 9001093 |
| 060 | 1.00 | 9001094 |
| 061 | 1.00 | 9001095 |
| 062 | 1.00 | 9001097 |
| 063 | 1.00 | 9001098 |
| 064 | 1.00 | 20176 |
| 065 | 1.00 | 25081 |
| 066 | 1.00 | 9001103 |
| 067 | 1.00 | 9001104 |
| 068 | 1.00 | 9001105 |
| 069 | 1.00 | 9001106 |
| 070 | 1.00 | 9001107 |
| 071 | 1.00 | 9001108 |
| 072 | 1.00 | 9001109 |
| 073 | 1.00 | 9001110 |
| 074 | 1.00 | 9001111 |
| 075 | 1.00 | 9001112 |
| 076 | 1.00 | 9001113 |
| 077 | 1.00 | 20174 |
| 078 | 1.00 | 25148 |
| 079 | 1.00 | 9001116 |
| 080 | 1.00 | 9001117 |
| 081 | 1.00 | 9001118 |
| 082 | 1.00 | 9001119 |
| 083 | 1.00 | 22127 |
| 084 | 1.00 | 9001121 |
| 085 | 1.00 | 25147 |
| 086 | 1.00 | 9001123 |
| 087 | 1.00 | 9001124 |
| 088 | 1.00 | 9001125 |
| 089 | 1.00 | 9001126 |
| 090 | 1.00 | 25171 |
| 091 | 1.00 | 9001128 |
| 092 | 1.00 | 22093 |
| 093 | 1.00 | 9001131 |
| 094 | 2.00 | 9001132 |
| 095 | 1.00 | 9001133 |
| 096 | 1.00 | 9001135 |
| 097 | 1.00 | 20088 |
| 098 | 1.00 | 22118 |

S R O E x a m B W R R e a c t o r
O r g a n i z e d b y Q u e s t i o n N u m b e r

| <u>QUESTION</u> | <u>VALUE</u> | <u>REFERENCE</u> |
|-----------------|--------------|------------------|
| 099 | 1.00 | 9001139 |
| | ----- | |
| | 100.00 | |
| | ----- | |
| | ----- | |
| | 100.00 | |

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PLANT WIDE GENERICS

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| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 001 | 1.00 | 294001A102 |
| 013 | 1.00 | 294001A103 |
| 014 | 1.00 | 294001A105 |
| 005 | 1.00 | 294001A110 |
| 006 | 1.00 | 294001A111 |
| 016 | 1.00 | 294001A113 |
| 010 | 1.00 | 294001A114 |
| 009 | 1.00 | 294001A114 |
| 008 | 1.00 | 294001A115 |
| 015 | 1.00 | 294001A116 |
| 003 | 1.00 | 294001K102 |
| 002 | 1.00 | 294001K102 |
| 004 | 1.00 | 294001K102 |
| 007 | 1.00 | 294001K103 |
| 011 | 1.00 | 294001K103 |
| 012 | 1.00 | 294001K103 |
| 017 | 1.00 | 294001K116 |
| ----- | | |
| PWG Total | 17.00 | |

PLANT SYSTEMS

Group I

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 020 | 1.00 | 202002K402 |
| 022 | 1.00 | 203000K114 |
| 021 | 1.00 | 203000K201 |
| 023 | 1.00 | 206000K407 |
| 024 | 1.00 | 206000K419 |
| 025 | 1.00 | 209001A403 |
| 026 | 1.00 | 209001K201 |
| 028 | 1.00 | 211000G005 |
| 027 | 1.00 | 211000K301 |
| 030 | 1.00 | 212000A108 |
| 029 | 1.00 | 212000A216 |
| 032 | 1.00 | 215004K406 |
| 033 | 1.00 | 215004K602 |
| 034 | 1.00 | 215005K301 |
| 035 | 1.00 | 215005K504 |
| 036 | 1.00 | 216000K501 |
| 037 | 1.00 | 217000A203 |
| 038 | 1.00 | 218000A203 |
| 039 | 1.00 | 259002A101 |
| 040 | 1.00 | 259002A306 |

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PLANT SYSTEMS

Group I

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 041 | 1.00 | 261000K605 |
| 054 | 1.00 | 262001G007 |
| 042 | 1.00 | 264000K408 |
| ----- | | |
| PS-I Total | 23.00 | |

Group II

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 018 | 1.00 | 201001G007 |
| 019 | 1.00 | 201002A303 |
| 043 | 1.00 | 201006A405 |
| 044 | 1.00 | 202001K401 |
| 045 | 1.00 | 204000A109 |
| 046 | 1.00 | 205000K114 |
| 047 | 1.00 | 214000K101 |
| 048 | 1.00 | 215002A203 |
| 031 | 1.00 | 215003K503 |
| 049 | 1.00 | 219000G010 |
| 050 | 1.00 | 230000A402 |
| 052 | 1.00 | 245000A207 |
| 055 | 1.00 | 271000A301 |
| ----- | | |
| PS-II Total | 13.00 | |

Group III

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 056 | 1.00 | 215001G007 |
| 051 | 1.00 | 239001K201 |
| 053 | 1.00 | 256000K105 |
| 057 | 1.00 | 268000K502 |
| ----- | | |
| PS-III Total | 4.00 | |
| ----- | | |
| PS Total | 40.00 | |

EMERGENCY PLANT EVOLUTIONS

Group I

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EMERGENCY PLANT EVOLUTIONS

Group I

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| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 061 | 1.00 | 295003A204 |
| 060 | 1.00 | 295003K302 |
| 063 | 1.00 | 295006G010 |
| 062 | 1.00 | 295006K207 |
| 064 | 1.00 | 295007K206 |
| 065 | 1.00 | 295009K301 |
| 067 | 1.00 | 295010A105 |
| 066 | 1.00 | 295010A201 |
| 069 | 1.00 | 295013G007 |
| 068 | 1.00 | 295013G010 |
| 059 | 1.00 | 295014K106 |
| 070 | 1.00 | 295014K207 |
| 071 | 1.00 | 295015A101 |
| 072 | 1.00 | 295015K204 |
| 073 | 1.00 | 295016K201 |
| 074 | 1.00 | 295016K202 |
| 076 | 1.00 | 295023G010 |
| 075 | 1.00 | 295023K204 |
| 078 | 1.00 | 295024K301 |
| 077 | 1.00 | 295024K307 |
| 079 | 1.00 | 295025K105 |
| 080 | 1.00 | 295025K204 |
| 081 | 1.00 | 295026G003 |
| 082 | 1.00 | 295027G007 |
| 083 | 1.00 | 295030K303 |
| 058 | 1.00 | 295037K101 |
| ----- | | |
| EPE-I Total | 26.00 | |

Group II

| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 084 | 1.00 | 295001G010 |
| 085 | 1.00 | 295001K207 |
| 087 | 1.00 | 295002G006 |
| 086 | 1.00 | 295002K204 |
| 089 | 1.00 | 295004A204 |
| 088 | 1.00 | 295004K105 |
| 090 | 1.00 | 295005K208 |
| 091 | 1.00 | 295008K209 |
| 093 | 1.00 | 295018A205 |
| 092 | 1.00 | 295018K202 |
| 094 | 2.00 | 295019K302 |
| 095 | 1.00 | 295020A206 |

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EMERGENCY PLANT EVOLUTIONS

Group II

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| <u>QUESTION</u> | <u>VALUE</u> | <u>KA</u> |
|-----------------|--------------|------------|
| 098 | 1.00 | 295021A201 |
| 096 | 1.00 | 295022K302 |
| 097 | 1.00 | 295028A203 |
| 099 | 1.00 | 295029K206 |
| ----- | | |
| EPE-II Total | 17.00 | |
| ----- | | |
| EPE Total | 43.00 | |
| ----- | | |
| ----- | | |
| Test Total | 100.00 | |

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ANSWER: 001 (1.00)

b.

REFERENCE:

BSEP/Vol. VI/OEOP-01-UG page 15

[4.2/4.2]

294001A102 ..(KA's)

ANSWER: 002 (1.00)

c.

REFERENCE:

AI-110 Rev. 5 page 4

[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 003 (1.00)

c.

REFERENCE:

OAI 58 page 17

Lesson Plan 1: LOI-CLS-LP-201-C

Objective: 01F

[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 004 (1.00)

a.

MASTER COPY

REFERENCE:

Plant Operating Manual Volume XXII OPLP-22 Rev. 2 page 6 (Book 33)

[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 005 (1.00)

b.

REFERENCE:

Plant Operating Manual Volume XXII OPLP-24 Rev. 9 page 17 (Book 33)

[3.6/4.2]

294001A110 ..(KA's)

ANSWER: 006 (1.00)

a.

REFERENCE:

OOI-04 Rev. 53 Page 8

[3.3/4.3]

294001A111 ..(KA's)

ANSWER: 007 (1.00)

c.

REFERENCE:

EOP-01-UG Rev. 20 Page 54

[3.3/3.8]

294001K103 ..(KA's)

ANSWER: 008 (1.00)

a.

REFERENCE:

OPS-CLS-SM-055A Rev. 0 page 8

[3.2/3.4]

294001A115 ..(KA's)

ANSWER: 009 (1.00)

d.

REFERENCE:

AOP-26.0 Rev.7 page 5

[2.9/3.4]

294001A114 ..(KA's)

ANSWER: 010 (1.00)

d.

REFERENCE:

AI-81 Rev. 11 page 10

[2.9/3.4]

294001A114 ..(KA's)

ANSWER: 011 (1.00)

c.

REFERENCE:

10 CFR 20.1003 page 374

[2.8/3.4]

294001K103 ..(KA's)

ANSWER: 012 (1.00)

b.

REFERENCE:

10 CFR 20.1201 page 377

[3.3/3.8]

294001K103 ..(KA's)

ANSWER: 013 (1.00)

b.

REFERENCE:

10 CFR 26.20 (a)(1) page 482

[2.7/3.7]

294001A103 ..(KA's)

ANSWER: 014 (1.00)

b.

REFERENCE:

AP Vol. I BK.1 Rev. 150 page 4-5 Vol. VII/OI-51 page 18 Item 3.2

[3.4/3.8]

294001A105 ..(KA's)

ANSWER: 015 (1.00)

d.

REFERENCE:

Vol. I BK. 1 page 2-8

[2.9/4.7]

294001A116 ..(KA's)

ANSWER: 016 (1.00)

a.

REFERENCE:

OOI-05 page 11

[4.5/4.3]

294001A113 ..(KA's)

ANSWER: 017 (1.00)

b.

REFERENCE:

OPFP-013 Rev. 11 page 7

[3.5/3.8]

294001K116 ..(KA's)

ANSWER: 018 (1.00)

a.

REFERENCE:

SM-008-B Rev. 0 page 8 LO 3.j

[3.6/3.7]

201001G007 ..(KA's)

ANSWER: 019 (1.00)

b.

REFERENCE:

SM-007-A page 56 LO.10 a.

[3.2/3.2]

201002A303 ..(KA's)

ANSWER: 020 (1.00)

d.

REFERENCE:

SM-002-A page 28 LO 17 d.

[3.0/3.0]

202002K402 ..(KA's)

ANSWER: 021 (1.00)

a.

REFERENCE:

SM-017-A page 4 LO 17 a.

[3.5/3.5]

203000K201 ..(KA's)

ANSWER: 022 (1.00)

c.

REFERENCE:

SM-017-A pages 32 and 31 LO 12.0 Exam Bank Question Number: LLA0193

[3.6/3.7]

203000K114 ..(KA's)

ANSWER: 023 (1.00)

d.

REFERENCE:

SM-019A page 32 LO 3 n. APP-011-1 pages 5, 41, and 62
[Recent Plant Modification]

[4.3/4.3]

206000K407 ..(KA's)

ANSWER: 024 (1.00)

c.

REFERENCE:

SM-019-A pages 13 and 14 LOs 3.o. and 3.p.

[3.7/3.8]

206000K419 ..(KA's)

ANSWER: 025 (1.00)

a.

REFERENCE:

SM-018-A Rev. 0 page 9 LO 11.e

[3.7/3.6]

209001A403 ..(KA's)

ANSWER: 026 (1.00)

b.

REFERENCE:

SM-018-A page 8 LO 13.a

[3.0/3.1]

209001K201 ..(KA's)

ANSWER: 027 (1.00)

c.

REFERENCE:

LEP-03 Rev. 12 page 3 SM-005-A LO 8.f Facility Exam Bank Question
Number, LLE0049 Modified

[4.3/4.4]

211000K301 ..(KA's)

ANSWER: 028 (1.00)

a.

REFERENCE:

Technical Specification 3/4.1.5 and 4.1.5.b SM-005A LO 12

[3.6/4.4]

211000G005 ..(KA's)

ANSWER: 029 (1.00)

c.

REFERENCE:

SM-003-A Rev. 1, Page 27 LO 8

[4.0/4.1]

212000A216 ..(KA's)

ANSWER: 030 (1.00)

d.

REFERENCE:

SM-003-A Rev.1 page 12 LOs 4.b, 4.e and 4.f

[3.4./3.4]

212000A108 ..(KA's)

ANSWER: 031 (1.00)

c.

REFERENCE:

SM-009-B Rev. 0 page 9 LO 3.a

[3.0/3.1]

215003K503 ..(KA's)

ANSWER: 032 (1.00)

d.

REFERENCE:

SM-009-A Rev.0 page 12 LO 3.a

[3.2/3.2]

215004K406 ..(KA's)

ANSWER: 033 (1.00)

a.

REFERENCE:

SM-009-A Rev. 0 page 15

[3.1/3.3]

215004K602 ..(KA's)

ANSWER: 034 (1.00)

a.

REFERENCE:

SM-009 Rev. 0 page 2 LO 4.g

[4.0/4.0]

215005K301 ..(KA's)

ANSWER: 035 (1.00)

c.

REFERENCE:

BSEP/Vol. II/SD-09 page 68

[2.9/3.2]

215005K504 ..(KA's)

ANSWER: 036 (1.00)

d.

REFERENCE:

SM-118-A Rev. 0 page 9 LO 5.1

[3.1/3.2]

216000K501 ..(KA's)

ANSWER: 037 (1.00)

d.

REFERENCE:

SM-016-A page 38 LO 4.b

[3.4/3.3]

217000A203 ..(KA's)

ANSWER: 038 (1.00)

c.

REFERENCE:

SM-020-A Rev. 0 page 6 LO 8

[3.4/3.6]

218000A203 ..(KA's)

ANSWER: 039 (1.00)

d.

REFERENCE:

SM-032-C Rev. 2 page 21 LO 6.a

[3.8/3.8]

259002A101 ..(KA's)

ANSWER: 040 (1.00)

d.

REFERENCE:

SM-032-C Rev. 2 page 47 LO 5

[3.0/3.0]

259002A306 ..(KA's)

ANSWER: 041 (1.00)

d.

REFERENCE:

SM-010-A Rev. 2 page 24 LO 9.g

[3.1/3.2]

261000K605 ..(KA's)

ANSWER: 042 (1.00)

a.

REFERENCE:

SM-039-A page 72 LOs 3 and 4

[3.8/3.7]

264000K408 ..(KA's)

ANSWER: 043 (1.00)

c.

REFERENCE:

SSM 27-2B RWM page 23 LO 7.a Facility Exam Bank, Question Number LLN0007

[3.2/3.2]

201006A405 ..(KA's)

ANSWER: 044 (1.00)

b.

REFERENCE:

SM-002-A Rev. 0 page 12 LO 5

[3.9/3.9]

202001K401 ..(KA's)

ANSWER: 045 (1.00)

a.

REFERENCE:

SM-014-A Rev. 0 page 28 LO 10.a

[3.0/3.2]

204000A109 ..(KA's)

ANSWER: 046 (1.00)

c.

REFERENCE:

20P-17 Rev. 106 page NOTE R15

[3.6/3.6]

205000K114 ..(KA's)

ANSWER: 047 (1.00)

d.

REFERENCE:

SSM 27-2B RWM page 29 SM-007-A LO 5.a

[3.0/3.2]

214000K101 ..(KA's)

ANSWER: 048 (1.00)

d.

REFERENCE:

SM-009-E Rev. 01 page 17 LO 4

[3.1/3.3]

215002A203 ..(KA's)

ANSWER: 049 (1.00)

c.

REFERENCE:

SM-017-A Rev. 0 page 12 LO 2

[3.4/3.5]

219000G010 ..(KA's)

ANSWER: 050 (1.00)

d.

REFERENCE:

EOP-02 Primary Containment Control Steps PC/P-4 and 5 SM-017-A LO 26

[3.8/3.6]

230000A402 .. (KA's)

ANSWER: 051 (1.00)

a.

REFERENCE:

SM-025-A Rev. 0 page 64 LO 6

[3.2/3.3]

239001K201 .. (KA's)

ANSWER: 052 (1.00)

c.

REFERENCE:

SM-026-C Rev. 2 page 24 LO 15

[3.8/3.9]

245000A207 .. (KA's)

ANSWER: 053 (1.00)

d.

REFERENCE:

CLS-SM-032-A Rev. 2 page 81

[3.1/3.1]

256000K105 .. (KA's)

ANSWER: 054 (1.00)

a.

REFERENCE:

SM-050B Rev. 2 page 24 LO 4

[3.4/3.5]

262001G007 .. (KA's)

ANSWER: 055 (1.00)

a.

REFERENCE:

SM-030-A Rev. 0 pages 38 and 39

[3.3/3.3]

271000A301 .. (KA's)

ANSWER: 056 (1.00)

b.

REFERENCE:

SM-009-A Rev. 3 page 2 LO 2.a

[2.8/3.0]

215001G007 .. (KA's)

ANSWER: 057 (1.00)

d.

REFERENCE:

SM-006-A REV .0 page 13 LO 3.c

[3.1/3.6]

268000K502 ..(KA's)

ANSWER: 058 (1.00)

d.

REFERENCE:

SM-300-E Rev. 2 page 9 step RC/L-12 LO 23 Facility Exam Bank, Question
Number LLE0338 Modified

[4.1/4.3]

295037K101 ..(KA's)

ANSWER: 059 (1.00)

b.

REFERENCE:

AOP-03 page 4 step 3.2(3) SM-002-A LO 39 Facility Exam Bank, Question
Number LLA0115

[3.8/3.9]

295014K106 ..(KA's)

ANSWER: 060 (1.00)

d.

REFERENCE:

SM-050-B page 20 LO 14.d Facility Exam Bank, Question Number LLA0148

[2.9/3.1]

295003K302 ..(KA's)

ANSWER: 061 (1.00)

b.

REFERENCE:

SM-050-B page 20 LO 13.c

[3.5/3.7]

295003A204 ..(KA's)

ANSWER: 062 (1.00)

b.

REFERENCE:

EOP-01-RSP Facility Exam Bank, Question Number LLE0273 Modified

[4.0/4.1]

295006K207 ..(KA's)

ANSWER: 063 (1.00)

c.

REFERENCE:

SM-300-C Rev. 1 page 2 LO 2

[4.1/4.2]

295006G010 ..(KA's)

ANSWER: 064 (1.00)

d.

REFERENCE:

SM-300-H Rev. 0 page 3 LO 4

[3.5/3.7]

295007K206 ..(KA's)

ANSWER: 065 (1.00)

c.

REFERENCE:

SM-002-A Rev. 0 page 25 LO 3.h

[3.2/3.3]

295009K301 ..(KA's)

ANSWER: 066 (1.00)

a.

REFERENCE:

SM-00-A Rev. 0 pages 7 and 8 LO 15.c

[3.4/3.8]

295010A201 ..(KA's)

ANSWER: 067 (1.00)

d.

REFERENCE:

2-OP-10 Rev. 49 page 22 SM-010-A page 12 LO 3

[3.1/3.4]

295010A105 ..(KA's)

ANSWER: 068 (1.00)

b.

REFERENCE:

AOP 30.0 Rev. 3 page 3 SM-020-A Rev. 0 LO 22

[3.8/3.6]

295013G010 ..(KA's)

ANSWER: 069 (1.00)

a.

REFERENCE:

EOP-2-PCCP Containment Limits Figure SM-300-L Rev. 1 page 44 LO 3.a

[3.3/3.5]

295013G007 ..(KA's)

ANSWER: 070 (1.00)

c.

REFERENCE:

AOP-02-. Rev. 5 page 4

[3.9/3.9]

295014K207 ..(KA's)

ANSWER: 071 (1.00)

b.

REFERENCE:

EOP-01--LEP-02 Rev. 10 page 14 SM-300-J Rev. 0 LO 5.

[3.8/3.9]

295015A101 ..(KA's)

ANSWER: 072 (1.00)

d.

REFERENCE:

EOP-01-LEP-02 Rev. 10 page 17 SM-300-J Rev. 0 LO 5.

[4.0/4.1]

295015K204 ..(KA's)

ANSWER: 073 (1.00)

c.

REFERENCE:

AOP-32.0 Rev. 24 page 4

[4.4/4.5]

295016K201 ..(KA's)

ANSWER: 074 (1.00)

a.

REFERENCE:

AOP-32.0 Rev. 24 page 5

[4.0/4.1]

295016K202 ..(KA's)

ANSWER: 075 (1.00)

c. or b. *Mike Ernest*
11/9/94

REFERENCE:

SM-305-A page 32 Rev. 0 LO 16.b

[3.2/3.4]

295023K204 ..(KA's)

ANSWER: 076 (1.00)

d.

REFERENCE:

AOP-07.0 Rev .2 page 3 LO 31

[3.9/3.9]

295023G010 ..(KA's)

ANSWER: 077 (1.00)

c.

REFERENCE:

SM-300-K Rev. 0 page 3 LO 3

[3.5/4.0]

295024K307 ..(KA's)

ANSWER: 078 (1.00)

c.

REFERENCE:

SM-300-L Rev. 1 pages 19 and 56 LO 3.g

[3.6/4.0]

295024K301 ..(KA's)

ANSWER: 079 (1.00)

a.

REFERENCE:

SM-002A Rev. 0 page 33 LO 19

[4.4/4.7]

295025K105 ..(KA's)

ANSWER: 080 (1.00)

b.

REFERENCE:

SM-002-A page 33 Rev. 0 LO .19

[3.9/4.1]

295025K204 ..(KA's)

ANSWER: 081 (1.00)

a.

REFERENCE:

Technical Specification 3.6.2.1.a.2

[3.2/4.3]

295026G003 .. (KA's)

ANSWER: 082 (1.00)

b.

REFERENCE:

Technical Specification Basis 3.6.1.6

[2.9/3.9]

295027G007 .. (KA's)

ANSWER: 083 (1.00)

d.

REFERENCE:

SM-300-L Rev. 1 page 31 LO 13

[3.6/3.7]

295030K303 .. (KA's)

ANSWER: 084 (1.00)

d.

REFERENCE:

AOP-04 Rev.9 page 4

[3.8/3.7]

295001G010 .. (KA's)

ANSWER: 085 (1.00)

b.

REFERENCE:

AOP-4.4 Rev. 4 page 3

[3.4/3.4]

295001K207 ..(KA's)

ANSWER: 086 (1.00)

b.

REFERENCE:

AOP-37 Rev. 3 page 3 SM-025-A Rev.0 LO 9.f

[3.2/3.3]

295002K204 ..(KA's)

ANSWER: 087 (1.00)

d.

REFERENCE:

SM-025-A page 18 LO 5.j

[3.4/3.4]

295002G006 ..(KA's)

ANSWER: 088 (1.00)

a.

REFERENCE:

SM-50-B Rev. 2 page 23 LO 7

[3.3/3.4]

295004K105 ..(KA's)

ANSWER: 089 (1.00)

a.

REFERENCE:

SM-016-A Rev. 1 page 51 LO 8.c

[3.2/3.3]

295004A204 ..(KA's)

ANSWER: 090 (1.00)

c.

REFERENCE:

SM-300-C page 5

[3.2/3.3]

295005K208 ..(KA's)

ANSWER: 091 (1.00)

b.

REFERENCE:

20P-14 Rev. 88 page 15 CAUTION SM-014-A LO 9.e

[3.1/3.1]

295008K209 ..(KA's)

ANSWER: 092 (1.00)

a.

REFERENCE:

AOP-19.0 Rev. 6 No Facility LO

[3.4/3.6]

295018K202 ..(KA's)

ANSWER: 093 (1.00)

c.

REFERENCE:

SM-021-A Rev. 1 page 7 LO 9.a Facility Exam Bank, Question Number
LLN0081 Modified

[2.9/2.9]

295018A205 ..(KA's)

ANSWER: 094 (2.00)

a. 7

b. 4

c. 2

d. 2

REFERENCE:

AOP-20.0 Rev. 15 SM-046-A LO 7

[3.5/3.4]

295019K302 ..(KA's)

ANSWER: 095 (1.00)

d.

REFERENCE:

SM-012-A Rev. 0 page 9 LO 6

[3.4/3.8]

295020A206 ..(KA's)

ANSWER: 096 (1.00)

a.

REFERENCE:

AOP-02.1 Rev. 3 page 4 SM-008-A LO 6.a

[2.9/3.1]

295022K302 ..(KA's)

ANSWER: 097 (1.00)

c.

REFERENCE:

Unit 2 Caution 1 Chart

[3.7/3.9]

295028A203 ..(KA's)

ANSWER: 098 (1.00)

c.

REFERENCE:

AOP-15.0 Rev. 5 page 7

[3.5/3.6]

295021A201 ..(KA's)

ANSWER: 099 (1.00)

C.

REFERENCE:

SM-300-L page 53 LO 3.d SM-020-A page 6 SM-04A pages 5 and 51

[3.4/3.5]

295029K206 ..(KA's)

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

REACTIVITY CONTROL SYSTEMS

3/4 1.5 STANDBY LIQUID CONTROL SYSTEM

LIMITING CONDITION FOR OPERATION

3.1.5 The standby liquid control system shall be OPERABLE with:

- a. An OPERABLE flow path from the storage tank to the reactor core, containing two pumps and two inline explosive injection valves.
- b. The contained solution volume-concentration within the limits of Figure 3.1.5-1, and
- c. The solution temperature above the limit of Figure 3.1.5-2.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2

ACTION:

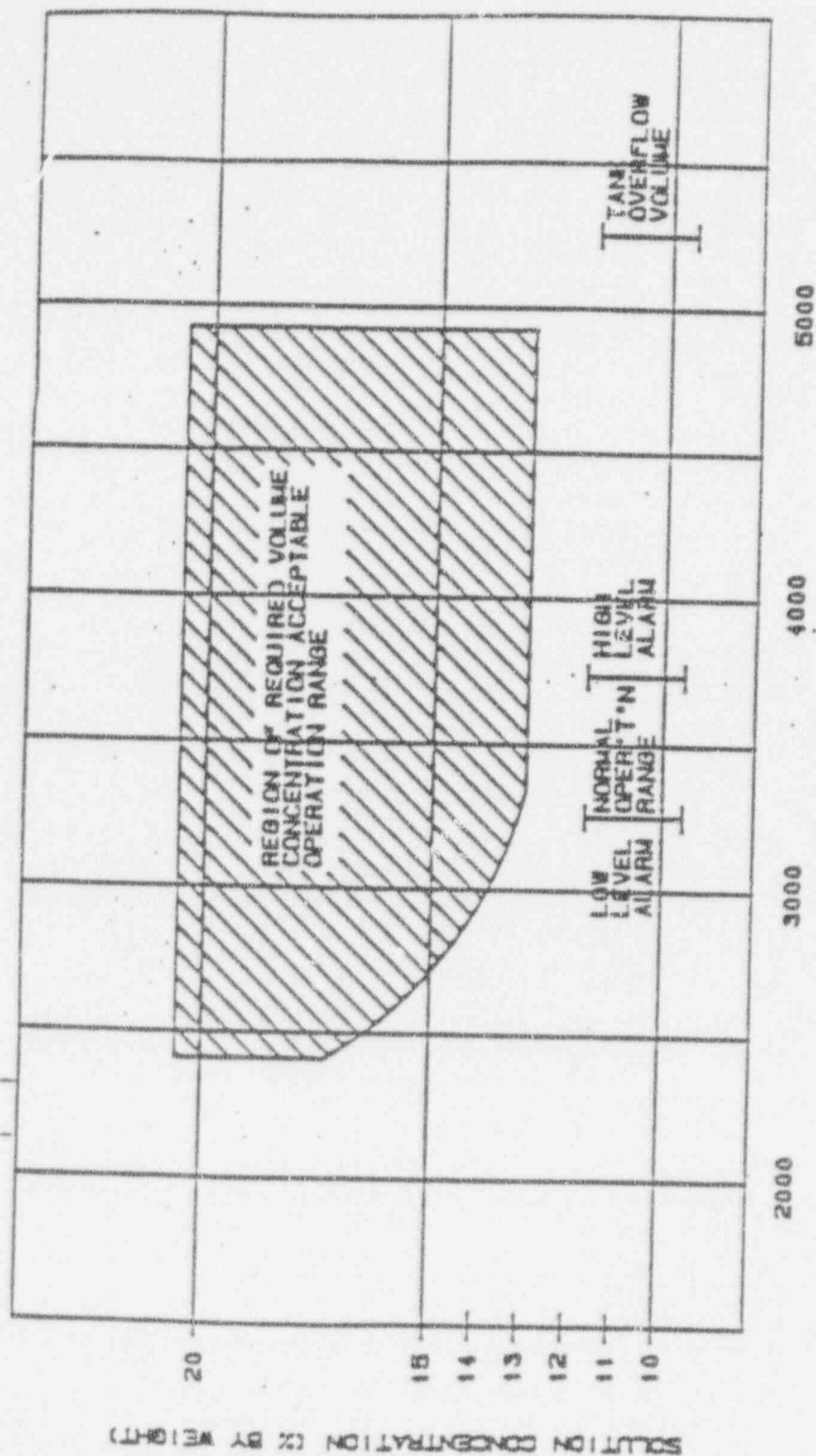
- a. In OPERATIONAL CONDITION 1 or 2:
 1. With one pump and/or one explosive valve inoperable, restore the inoperable pump and/or explosive valve to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours.
 2. With the standby liquid control system inoperable, restore the system to OPERABLE status within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours.

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS

4.1.5 The standby liquid control system shall be demonstrated OPERABLE:

- a. At least once per 24 hours by verifying that:
 1. The volume and temperature of the sodium pentaborate solution are within the limits of Figures 3.1.5-1 and 3.1.5-2, and
 2. The heating tracing circuit is OPERABLE.
- b. At least once per 31 days by:
 1. Starting each pump and recirculating demineralized water to the test tank,
 2. Verifying the continuity of the explosive charge, and
 3. Determining the concentration of boron in solution by chemical analysis. This test shall also be performed anytime water or boron is added to the solution or when the solution temperature drops below the limit established in Figure 3.1.5-2.
- c. At least once per 18 months during shutdown by:
 1. Initiating one of the standby liquid control system loops, including an explosive valve, and verifying that a flow path from the pumps to the reactor pressure vessel is available by pumping demineralized water into the reactor vessel. The replacement charge for the explosive valve shall be from the same manufactured batch as the one fired or from another batch which has been certified by having one of that batch successfully fired. Both injection test loops shall be tested in 36 months.
 2. Demonstrating that the minimum flow requirement of 41.2 gpm per pump at a pressure of greater than or equal to 1190 psig is met.
 3. Demonstrating that the pump relief valve setpoint is 1450 ± 50 psig.



NET VOLUME OF SOLUTION IN TANK (GALS.)

SODIUM PENTABORATE SOLUTION VOLUME
CONCENTRATION REQUIREMENTS

FIGURE 3.1.5-1

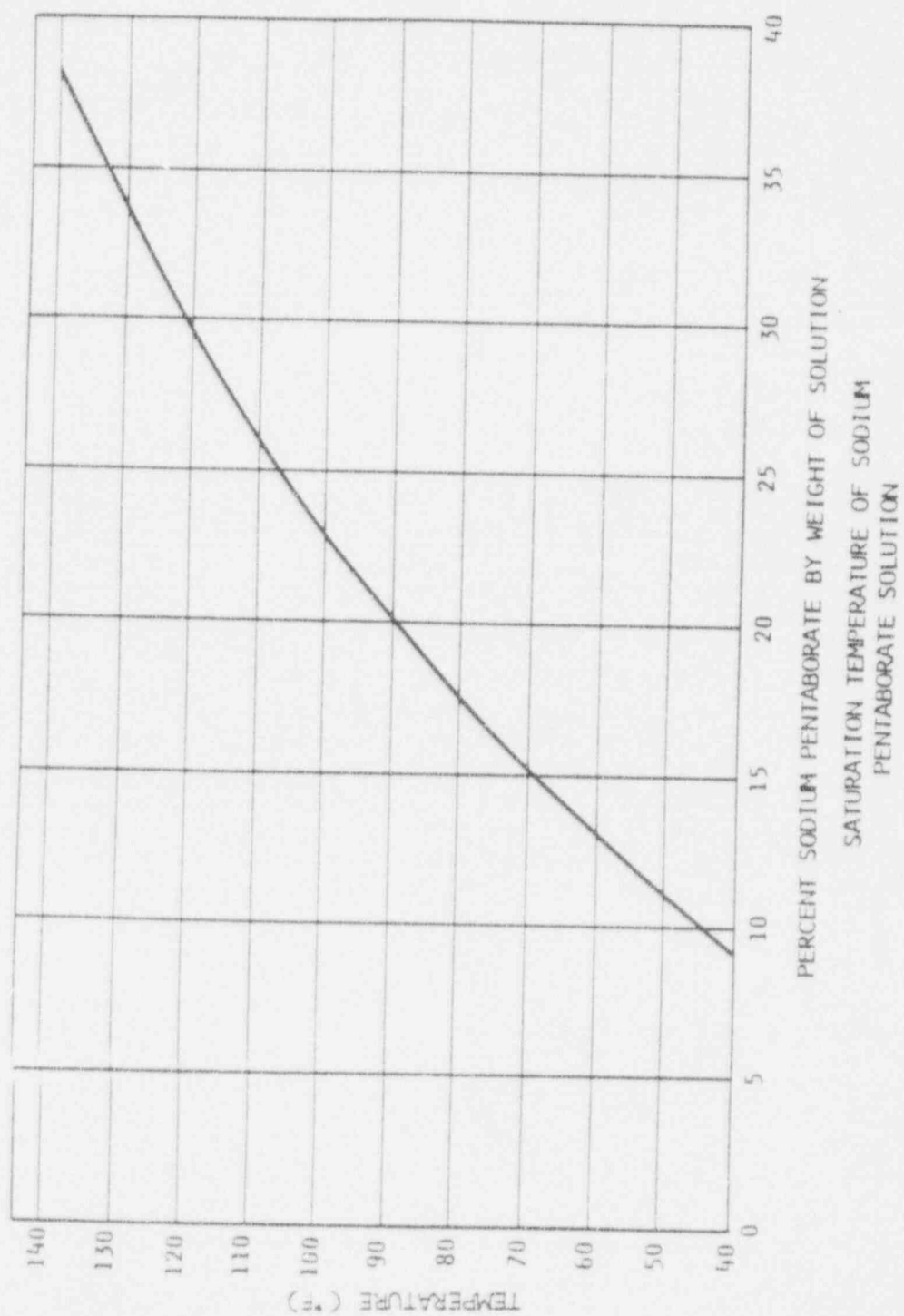


FIGURE 3.1.5-2

TABLE II - DETECTORS INCLUDED IN APRM CHANNEL (Cont'd)

| Detector Location & Level | Drywell Pent. No. | APRM Channel | Detector Location & Level | Drywell Pent. | APRM Channel |
|---------------------------|-------------------|--------------|---------------------------|---------------|--------------|
| 04-37B | X-100E | C | 12-37B | X-100F | D |
| 36-37B | X-100E | C | 44-37B | X-100F | D |
| 20-21B | X-100E | C | 28-21B | X-100F | D |
| 36-05B | X-100E | C | 28-37D | X-100F | D |
| 20-37B | X-100E | C | 12-21D | X-100F | D |
| 04-21D | X-100E | C | 44-21D | X-100F | D |
| 36-21D | X-100E | C | 28-05D | X-100F | D |
| 20-05D | X-100E | C | 20-45A | X-100F | D |
| 12-45A | X-100E | C | 04-29A | X-100F | D |
| 44-45A | X-100E | C | 36-29A | X-100F | D |
| 28-29A | X-100E | C | 20-13A | X-100F | D |
| 12-13A | X-100E | C | 36-45C | X-100F | D |
| 44-13A | X-100E | C | 20-29C | X-100F | D |
| 28-45C | X-100E | C | 36-13C | X-100F | D |
| 12-29C | X-100E | C | | | |
| 44-29C | X-100E | C | | | |
| 28-13C | X-100E | C | | | |

| Detector Location & Level | Drywell Pent. No. | APRM Channel | Detector Location & Level | Drywell Pent. | APRM Channel |
|---------------------------|-------------------|--------------|---------------------------|---------------|--------------|
| 12-45B | X-100C | E | 20-45B | X-100H | F |
| 44-45B | X-100C | E | 04-29B | X-100H | F |
| 28-29B | X-100C | E | 36-29B | X-100H | F |
| 12-13B | X-100C | E | 20-13B | X-100H | F |
| 44-13D | X-100C | E | 36-45D | X-100H | F |
| 28-45D | X-100C | E | 20-29D | X-100H | F |
| 12-29D | X-100C | E | 36-13D | X-100H | F |
| 44-29D | X-100C | E | 28-37A | X-100H | F |
| 28-13D | X-100C | E | 12-21A | X-100H | F |
| 20-37A | X-100C | E | 44-21A | X-100H | F |
| 04-21A | X-100C | E | 28-05A | X-100H | F |
| 36-21A | X-100C | E | 12-37C | X-100H | F |
| 20-05A | X-100C | E | 44-37C | X-100H | F |
| 04-37C | X-100C | E | 28-21C | X-100H | F |
| 36-37C | X-100C | E | | | |
| 20-21C | X-100C | E | | | |
| 36-05C | X-100C | E | | | |

Figure 1
Thermal Power Limitations

