UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

ENCLOSURE 1

REPORT DETAILS

Facility Licensee: System Energy Resources, Inc.
Jackson, MS 39205

Facility Docket No.: 50-416

Facility License No.: NPF-29

Examinations were administered at Grand Gulf Nuclear Station near Vicksburg, Mississippi.

Chief Examiner: George T. Hopper — 3/14/90
George T. Hopper — Date Signed

Approved By: John F. Munro — 3/15/90
John F. Munro, Chief — Date Signed
Operator Licensing Section 1
Division of Reactor Safety

Summary

Examinations were administered on December 18 - 22, 1989.

Written examinations and operator tests were administered to ten SRO and two RO applicants. All candidates passed the examination.

REPORT DETAILS

1. Facility Employees Contacted:

*W. T. Cottle
*M. Shelly
*C. V. Hicks
*J. L. Robertson
*C. A. Bottemiller
M. Wagner

*Attended Exit Meeting

2. Examiners:

*G. T. Hopper, NRC
C. W. Rapp, NRC
K. R. Mikkelsen, PNL
L. L. Larson, PNL

*Chief Examiner

3. Pre-Examination Review

On December 5-7, 1989, members of the facility staff reviewed the written examination at the Region II office. This review was conducted to ensure that all test items were clear and technically correct prior to the examination administration.

4. Post-Examination Review

Following examination administration, the facility was allowed to review the written examination. A copy of the examination is included as Enclosure 2. The facility submitted comments on a total of 14 separate questions. Four comments were editorial in nature and contained suggestions for improving the questions. Two comments resulted from the submission of inadequate or outdated reference material. It is hoped that future efforts during the pre-exam review will greatly reduce the number of post-exam comments.

The NRC resolutions to these comments are contained in this report as Enclosure 4.

5. Exit Meeting

At the conclusion of the site visit the examiners met with representatives of the plant staff to discuss the results of the examinations. The following observations were made concerning areas of generic weaknesses.

a. Five of six candidates were unable to diagnose the cause of the event for scenario 1-A (Resin Injection into the RPV). These candidates were asked follow-up questions upon scenario completion. Only one candidate realized that resin injection could produce the observed plant response during the scenario. The end result of this generic lack of knowledge was that not one member of either crew referred to the "Resin Intrusion into Rx Vessel" off-normal event procedure.

b. In general, formal communications exhibited in the the control room simulator were weak. SROs need more practice in Command and Control communication skills. ROs need more training in repeat backs of commands and in ensuring the SROs acknowledge the ROs' reports.

The cooperation given to the examiners and the effort to ensure an atmosphere in the control room conducive to oral examinations was noted and appreciated.

The licensee did not identify as proprietary any of the material provided to or reviewed by the examiners.

ENCLOSURE 2a

NRC Official Use Only

MASTER RO
EXAM & ANSWER KEY

Nuclear Regulatory Commission
Operator Licensing
Examination

This document is removed from
Official Use Only category on
date of examination.

NRC Official Use Only

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

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

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

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

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

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

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

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

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

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

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

11. If you are using separate sheets, number each answer as to category and number (i.e. Plant Systems # 04, EPE # 10) and skip at least 3 lines between answers to allow space for grading.

12. Write "End of Category " at the end of your answers to a category.

13. Start each category on a new page.

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

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

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

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

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

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

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

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

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

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

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

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

FACILITY: Grand Gulf 1

REACTOR TYPE: BWR-GE6

DATE ADMINSTERED: 89/12/18

CANDIDATE:

INSTRUCTIONS TO CANDIDATE:

Points for each question are indicated in parentheses after the question. The passing grade requires at least 80% correct overall. Examination papers will be picked up four and one half (4 1/2) hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	NUMBER CORRECT	CATEGORY
~~29.00~~ 27.50	~~36.25~~ 36.18		EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (36%)
~~51.00~~ 48.50	~~63.75~~ 63.82		PLANT SYSTEMS (51%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (13%)
~~80.00~~ 76.00		OVERALL	

_____ % CORRECT OVERALL

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

_____
Candidate's Signature

QUESTION: 01 (1.00)

WHICH ONE (1) of the following causes a reactor scram as a result of a recirculation pump shaft seizure, according to ONEP 05-1-02-III-3, "Decrease in Recirculation System Flow Rate?" Assume the Mode Switch is in RUN. (1.0)

a. RPV Low Level

b. RPV High Level

c. RPV High Pressure

d. APRM Flow-biased Thermal Power

QUESTION: 02 (1.00)

WHICH ONE (1) is the correct action if ALL rod position indication is lost, in accordance with ONEP 05-1-02-IV-6, "Loss of RPIS?" (1.0)

a. Suspend control rod movement if nuclear instrumentation does not respond when control rod movement commands are given.

b. Individual control rod movement is limited to single notch movement, gang movement is prohibited.

c. Control rod movement is only allowed by Scram.

d. Positions before and after control rod movement must be verified on process computer printout by a second licensed operator.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 03 (1.00)

A complete loss of instrument air has occurred.

WHICH ONE (1) of the following immediate operator actions is required in accordance with ONEP-05-01-02-V-16, "Loss of DW Chilled Water"? (1.0)

The immediate operator action is to place the drywell chillers on:

a. Plant Service Water.

b. Standby Service Water.

c. Turbine Building Cooling Water.

d. Component Cooling Water.

QUESTION: 04 (1.00)

One recirculation pump has tripped resulting in a decrease in Recirculation System flow rate. WHICH ONE (1) of the following immediate operator actions in accordance with ONEP-05-1-2-III-3 "Decrease in Recirculation System Flow Rate", is required for the affected loop? (1.0)

a. CLOSE the recirculation pump suction valve and place the FCV to minimum (CLOSED) position.

b. CLOSE the recirculation pump discharge valve and place the FCV to the maximum (OPEN) position.

c. CLOSE the recirculation pump suction valve and place the FCV to the maximum (OPEN) position.

d. CLOSE the recirculation pump discharge valve and place the FCV to minimum (CLOSED) position.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 05 (1.00)

Three days ago a severe fire occurred at GGNS. The reactor is now in cold shutdown with the recirculation pumps off. Due to fire damage the remaining shutdown cooling loop fails.

WHICH ONE (1) of the following actions is required with NO recirculation pumps OR shutdown cooling loops available? (1.0)

a. Open or check open the reactor pressure vessel head vent.

b. Raise the reactor vessel level to 82 inches.

c. Stop all RWCU cleanup reject flow.

d. Utilize one of the diesel-driven fire pumps and hoses to establish an alternate shutdown cooling path.

QUESTION: 06 (1.00)

The reactor is at 96% power when a complete loss of Component Cooling Water (CCW) occurs.

In accordance with ONEP-05-1-02-V-1, "Loss of Component Cooling Water", WHICH ONE (1) of the following immediate operator actions is required? (1.0)

a. Reduce reactor power to minimize heat load.

b. Manually trip the Recirculation Pumps within one minute.

c. Isolate the Fuel Pool Heat Exchangers.

d. Isolate the Reactor Water Cleanup System.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 07 (1.00)

In accordance with Alarm Response Instruction 04-1-1H13-P601-19A-5A, when an ADS valve is stuck open, WHICH ONE (1) is the correct suppression pool temperature at which the mode switch must be placed in the SHUTDOWN position? (1.0)

a. 95 deg F

b. 105 deg F

c. 110 deg F

d. 120 deg F

QUESTION: 08 (1.00)

In EP-2A, RPV Flooding, if RPV pressure cannot be restored and maintained above MARFP, Minimum Alternate RPV Flooding Pressure, the instruction is to "...Slowly Inject into the RPV...".

WHICH ONE (1) reason is listed in the caution statement for SLOWLY injecting? Reference attachment if desired. (1.0)

a. A rapid increase in injection may induce thermal stresses in the vessel nozzles.

b. Steam formation could cause rapid overpressurization of the RPV.

c. A rapid increase in injection into the RPV may induce a large power excursion.

d. Vortexing and subsequent water hammer may damage injection piping.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

delete

QUESTION: 09 (1.00)

At 90% power the following conditions are observed:

- Main turbine control valves closing.
- Bypass valves do not open
- Pressure Controller Failure Annunciator.
- Reactor power and pressure increasing.
- Changeover lights illuminate on BCVs.
- Decreasing main generator output.
- Pressure controller fault light on Panel H13-P680.
- Bypass Aux channel fault illuminate.
- Scram has not occurred

WHICH ONE (1) of the following failures exist? (1.0)

a. Pressure signal is lost to one of the IPC channels.

b. EHC Fluid pressure indicates zero psig.

c. Failure of either of the EHC valve lift controllers.

d. Electrical fault in the bypass valve opening jack.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 10 (1.00)

A Turbine Building Release Radiation Monitor Hi-Hi radiation annunciator alarms. Radwaste, Control Room and Auxiliary Building monitors indicate normal readings.

WHICH ONE (1) of the following immediate operator actions is required according to ONEP-05-1-02-II-3, "Offsite Gaseous Releases"? (1.0)

a. Initiate Standby Gas Treatment and contact Health Physics/ Chemistry to take radiation and airborne surveys.

b. Scram the reactor and evacuate personnel from suspect areas of high gaseous activity.

c. Trip the Turbine/Generator and contact Health Physics/ Chemistry to take radiation and airborne surveys.

d. Isolate the Turbine Building ventilation and evacuate personnel from suspect areas of high gaseous activity.

QUESTION: 11 (1.00)

WHICH ONE (1) of the following conditions exists when Suppression Pool water level is at 14 feet? Reference attachment if desired. (1.0)

a. Suppression Pool level below the RCIC turbine exhaust discharge to Suppression Pool.

b. Suppression Pool uppermost horizontal vents uncovered.

c. Suppression Pool level below the minimum indicating level.

d. Suppression Pool temperature can not be determined.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 12 (1.00)

A High-High radiation level is sensed by the Fuel Handling Area Ventilation monitors while operating at 100% power.

WHICH ONE (1) of the following is an IMMEDIATE operator action per ONEP-05-1-C2-II-9, "High Airborne"? (1.0)

a. Reduce reactor power as necessary to reduce radiation levels to below the Hi-Hi setpoint.

b. Monitor the affected area radiation monitoring modules to determine the extend of the airborne problem.

c. Implement the Emergency Plan.

d. Notify Health Physics.

QUESTION: 13 (1.00)

WHICH ONE (1) below completes the following?

The "Minimum Steam Cooling Water Level" is -197 inches. This is the lowest RPV water level at which the covered portion of the reactor will generate sufficient steam to _____. (1.0)

a. prevent pellet-clad interaction

b. prevent a sustained zirconium water reaction

c. prevent 950 degree F peak center line temperature

d. prevent clad temperature from exceeding 1500 degrees F

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 14 (2.00)

The reactor is at 75% rated thermal power when a failure occurs in the Recirculation system.

In accordance with ONEP-05-1-02-III-3 "Decrease in Recirculation System Flow Rate", MATCH the immediate operator actions in Column B with the plant operating conditions given in Column A. Items in Column B may be used more than once or not at all. Attached is a GGNS power to flow map. (2.0)

	Column A			Column B actions
	% of thermal pwr	/	% of rated flow	
a.	50	/	22	1. Reduce thermal power by inserting control rods to within Region B. D
b.	50	/	33	2. Increase thermal power by withdrawing control rods to within Region D.
c.	55	/	42	3. Reduce core flow to to within Region B.
d.	60	/	48	4. Trip both recirculation pumps to OFF.
				5. Scram the reactor.
				6. No Action required.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 15 ~~(2.00)~~ 1.50

While operating at full power, the plant experiences a total loss of Instrument Air.

MATCH the failure mode in Column B with the components in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. CRD Flow Control valves	____	1. Fails as is
b. Main Steam Isolation valves (MSIV)	____	2. Fails open
c. Feedwater startup flow control valve.	____	3. Fails closed
d. Main Steam line drain valves.	____	4. Not Affected

delete

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 16 (2.00)

MATCH the correct Main Condenser Vacuum setpoint in Column B with action/trip in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Turbine Trip	____	1. 27" Hg vac
b. Main Steam Bypass Valve Closes	____	2. 25" Hg vac
c. Reactor Feed Pump Trip	____	3. 23" Hg vac
d. Group I isolation	____	4. 21" Hg vac
		5. 19" Hg vac
		6. 16" Hg vac
		7. 12" Hg vac
		8. 9" Hg vac

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 17 (2.50)

MATCH the correct Emergency Operating Procedure that should be entered in Column B with the condition in Column A. Items in Column B may be used more than once or not at all. (2.5)

Column A		Column B
a. Reactor pressure of 1040 psig	____	1. None
b. RPV water level at 9.4"	____	2. EP-2 "RPV Control"
c. Suppression pool average temperature at 105 deg F	____	3. EP-3 "~~Primary~~ Containment Control"
d. Area radiation levels greater than the maximum normal operating levels	____	4. EP-4 "~~Secondary~~ Containment and Radioactive Release Control"
e. Primary containment or drywell hydrogen concentration at 0.4%	____	

Auxiliary Building

QUESTION: 18 (1.00)

FILL IN THE BLANKS. According to EP-3 "Containment Control", start the hydrogen ignitors if any of the following conditions exist.

a. Hydrogen concentration reaches _____. (0.5)

b. RPV water level drops to _____. (0.5)

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 19 (2.00)

LIST the immediate operator actions required to place the standby CRD pump in service following a trip of the operating CRD pump, in accordance with ONEP-05-1-02-IV-1, "Control Rod/Drive Malfunctions." (2.0)

QUESTION: 20 (1.00)

A PARTIAL loss of Component Cooling Water has occurred. You are monitoring the Reactor Recirculation System.

STATE the immediate operator action per ONEP-05-1-02-V-1 "Loss of Component Cooling Water", for EACH of the following operating conditions.

a. The Reactor Recirculation pump and motor temperatures both show an increase of 4 degrees F. (0.5)

b. The high temperature alarm comes in for the Reactor Recirculation pump. (0.5)

QUESTION: 21 (1.50)

A reactor scram has occurred and you have performed the following immediate operator actions:

- Verified all control rods are fully inserted.
- Verified power decreasing.

STATE the remaining immediate operator action(s) AND the specific parameter(s) that must be observed while performing those action(s) in accordance with ONEP-05-1-02-I-1, "Reactor Scram". (1.5)

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 22 (2.00)

Given a total loss of AC power, STATE the FOUR (4) BOP pumps that the operator should start or verify have autostarted per ONEP 05-1-02-I-4, "Loss of AC Power". (2.0)

(***** END OF CATEGORY 2 *****)

QUESTION: 01 (1.00)

WHICH ONE (1) of the following refueling conditions will result in a rod block with the Mode switch in the REFUEL position? (1.0)

a. The refueling platform is positioned over the reactor core and one control rod is withdrawn.

b. The refueling platform is positioned over the reactor core and the main hoist fuel grapple is loaded.

c. The refuel platform is positioned away from the reactor core and the main hoist fuel grapple is loaded.

d. The refueling platform is positioned away from the reactor core and one control rod is withdrawn.

QUESTION: 02 (1.00)

You are unable to drive one control rod. ONEP-05-1-02-IV-1 states; "Increase drive water pressure in 25 psi increments and attempt to drive the affected rod."

WHICH ONE (1) statement correctly describes the actions required to increase drive water pressure? (1.0)

a. Throttle valve F003 is throttled closed.

b. Bypass valve F004 is throttled opened.

c. Stabilizing valves are opened.

d. Flow control valves are closed.

(***** CATEGOPY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 03 (1.00)

WHICH ONE (1) of the following is a possible consequence of allowing CRD cooling water differential pressure to exceed 20 psid? (1.0)

a. Damage to the Control Rod Drive (CRD) during a scram.

b. CRD seal damage

c. Control Rod drift

d. Over pressurization of the recirculation loop seal purge system.

QUESTION: 04 (1.00)

A reactor scram has occurred following a recirculation loop suction line LOCA. The STA has determined that you are in the unsafe region of the RPVST curve of EP-2, "RPV Control".

WHICH ONE (1) of the following statements correctly describes the relationship between indicated and actual reactor vessel level? Assume vessel level is above TAF. (1.0)

a. Actual reactor vessel water level LESS than indicated due to variable leg flashing.

b. Actual reactor vessel water level LESS than indicated due to reference leg flashing.

c. Actual reactor vessel water level GREATER than indicated due to reference leg flashing.

d. Actual reactor vessel water level GREATER than indicated due to variable leg flashing.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 05 (1.00)

WHICH ONE (1) completes the following sentences?

The Feedwater Level Control System is controlling level in automatic using the Startup Level Control Valve. On a complete loss of one feedwater flow signal the reactor water level will _____. On a failure of the level signal LOW (gross failure) the reactor water level will _____. (1.0)

a. stay the same, increase

b. stay the same, decrease

c. increase, increase

d. increase, decrease

QUESTION: 06 (1.00)

WHICH ONE (1) of the following interlocks will PREVENT a Standby Liquid Control Pump from starting when initiated from the Control Room? (1.0)

a. Failure of the Electrically Activated Explosive (SQUIB) Valve to detonate.

b. Incomplete isolation of the Reactor Water Cleanup (RWCU) system.

c. Complete loss of instrument air to SLC.

d. Suction valve from SLC storage tank closed.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 07 (1.00)

WHICH ONE (1) trip function remains active (i.e. NOT BYPASSED) when the Division III Emergency Diesel Generator is operating on a valid LOCA initiation signal? (1.0)

a. Generator overcurrent with voltage restraint

b. Low lube oil pressure

c. High jacket water temperature

d. Differential Current

QUESTION: 08 (1.00)

WHICH ONE (1) of the following signals will result in an isolation of the Control Room ventilation system? Assume the ventilation keylock handswitch is in AUTO. (1.0)

a. High Freon concentration (150 ppm)

b. High Chlorine Gas concentration (5 ppm)

c. High-High radiation level (5 mR/hr)

d. High Freon AND a smoke detector signal

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 09 (1.00)

WHICH ONE (1) of the following abnormal CRD operating conditions may cause CRD seal damage? (1.0)

a. Closing the HCU isolation valves with the reactor at operating pressure and temperature.

b. Insufficient charging water header pressure and temperature.

c. Insufficient scram accumulator nitrogen charging pressure.

d. Scramming a rod located between positions 08 and 02 with the reactor at low pressure.

delete from exam

QUESTION: 10 (1.00)

WHICH ONE (1) of the following functions/isolations is initiated when all four NSSSS manual isolation pushbuttons are armed and depressed? (1.0)

a. Thirty minute timer for suppression pool make-up dump logic.

b. One hundred five second timer for ADS activation logic.

c. RCIC exhaust vacuum breaker isolation.

d. LPCS test line isolation.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 11 (1.00)

WHICH ONE (1) of the following actions will occur as a result of a Standby Gas Treatment (SBGT) initiation? (1.0)

a. All the ventilation dampers which isolate the Auxiliary Building will close.

b. All the ventilation dampers which isolate the Control room will close.

c. All the ventilation dampers which isolate the Enclosure Building will close.

d. All the ventilation dampers which isolate the Radwaste Building will close.

QUESTION: 12 (1.00)

WHICH ONE (1) of the following prerequisites is necessary for initiation of the Main Steam Line Leakage Control System (MSL LCS)? Assume a LOCA has occurred and all prerequisites are met EXCEPT for the one remaining to be selected from below. (1.0)

a. MSL LCS dilution blower started.

b. MSL LCS dilution blower stopped.

c. Reactor pressure greater than 20 psig.

d. Reactor pressure less than 20 psig.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 13 (1.00)

WHICH ONE (1) of the following conditions will result in a ROD BLOCK from the Source Range Monitoring (SRM) System? (1.0)

a. IRM = Range 2, Mode Switch = RUN, SRM count = 0.5 cps.

b. IRM = Range 9, Mode Switch = RUN, SRM count = 1.5 X 10E5 cps.

c. IRM = Range 2, Mode Switch = Startup, SRM count = 0.5 cps.

d. IRM = Range 9, Mode Switch = Startup, SRM count = 1.5 X 10E5 cps.

QUESTION: 14 (2.00)

MATCH the correct setpoint in Column B with the event/interlock in Column A. Setpoints in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. LPCI low pressure permissive input to ADS.	____	1. 475 psig
		2. 400 psig
b. Shutdown cooling isolation.	____	3. 250 psig
c. Permissive for manual operation of LPCI inboard injection valve.	____	4. 150 psig
d. RCIC low steam pressure isolation.	____	5. 135 psig
		6. 125 psig
		7. 60 psig

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 15 (2.00)

MATCH the correct setpoints from Column B with the RHR system isolations of Column A. Items from Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. RHR shutdown cooling valves and head spray valves isolate.	____	1. High Drywell pressure (1.39 psig)
b. Control Solenoid valves to radwaste discharge valve (F203) isolate.	____	2. High RHR equipment area temperature (99 degrees F)
c. Sample lines (F060A/B and and F075A/B), RHR Shutdown Cooling upper pool valve F037A/B) isolate.	____	3. Vessel water level below +11.4 inches
d. Discharge to radwaste isolation valves (F040 and F049) isolate.	____	4. Vessel water level below -41.6 inches
		5. Vessel water level below -150.3 inches

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 16 (1.50)

MATCH the action/function from Column B with the operating modes in Column A. Items in Column B may be used more than once or not at all. (1.5)

Column A		Column B
a. Setpoint Setdown Mode	_____	1. Maximizes reactor steam carry over and carry under.
b. Single Element Mode	_____	2. Anticipates level changes resulting from changes in feedflow and steam flow.
c. Three-element Automatic	_____	3. Manually controls level with Startup Level controller.
		4. Controls RFPT speed in the event the Electronic Automatic Position (EAP) "Locks Up".
		5. Used at low steam and feed flows (less than 40%).
		6. Automatically initiated when reactor level reaches +11.4".

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 17 ~~(2.00)~~ 1.50

MATCH the rod block type from Column B with the RC&IS conditions in Column A. Items in Column B may be used more than once or no at all. 1.5 ~~(2.0)~~

Column A		Column B
a. One rod selected and driving	____	1. Select Block
b. Rod Pattern Controller sequence violation (greater that 20% power)	____	2. Insert Block
c. IRM wrong position, detector not full in while in SHUTDOWN mode	____	3. Withdrawal Block
d. IRM range 2 and SRM downscale	____	4. No Rod Block

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 18 (2.00)

MATCH the correct Recirculation Flow Control Valve (FCV) response from Column B with the operating conditions from Column A. Assume the Recirculation Pumps are in fast speed. Items in Column B may be used more than once or not at all. (2.0)

Column A (Condition)		Column B (Flow Control Valve (FCV) Response)
a. Reactor water level DECREASES to level 4 and less than two feedwater pumps are running.	____	1. FCV limited to 102.5% drive flow MAXIMUM.
b. Position Controller demand signal at zero percent indicated position).	____	2. FCV limited to 40% drive flow MINIMUM.
c. Drywell pressure INCREASES to HIGH DRYWELL PRESSURE (1.23 psig).	____	3. FCV at 40% open position (actual).
d. Both Hydraulic Power Units (HPU) failure due to undervoltage condition.	____	4. FCV at 20% open position (actual).
		5. FCV runback.
		6. FCV motion inhibit.
		7. No FCV response.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 19 (2.00)

MATCH the correct power supply in Column B with the HPCS equipment in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Power to HPCS pump breaker control logic.	____	1. 120 VAC
b. Power to HPCS injection valve.	____	2. 125 VDC
c. Power to HPCS initiation control logic.	____	3. 125 VAC
d. Power to HPCS pump.	____	4. 250 VDC
		5. 480 VAC
		6. 4160 VAC
		7. 6900 VAC

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 20 (2.50)

MATCH the setpoint in Column B with the event/interlock in Column A. Setpoints in Column B may be used more than once or not at all. (2.5)

	Column A		Column B
a.	Maximum suppression pool temperature while operating RCIC, per EP-3 "Containment Control."	____	1. 101 deg F 2. 125 deg F
b.	CCW pump cooling water temperature to trip Reactor Water Cleanup pumps.	____	3. 140 deg F 4. 175 deg F
c.	Maximum suppression pool temperature while operating HPCS, LPCS and RHR in the LPCI mode.	____	5. 185 deg F 6. 195 deg F
d.	Group 1 isolation setpoint for Main Steam Line ambient High temperature	____	7. 200 deg F 8. 212 deg F
e.	Group 1 isolation setpoint for Main Steam Line ventilation differential high temperature.	____	9. 220 deg F

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 21 (2.00)

MATCH the correct condition from Column B with the correct indication on P680 panel from Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Channel Disagree	____	1. The RGDS finds disagreement between signals received from the two RACS.
b. Data Fault	____	
c. Insert Required	____	2. The selected rod must be fully inserted before any other control rod can be moved.
d. Scram Valves	____	
		3. The selected rod must be inserted until reed switch pairs are in agreement.
		4. All scram valves are not in the same position.
		5. More than one reed switch closed (per RPIS channel) (except full in/full out).
		6. The RACS disagrees with the indicated scram valve position.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 22 (2.00)

Relative to the Radiation Monitoring System:

MATCH the correct action in Column B resulting from initiation/isolation signals with the radiation monitoring equipment in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Fuel Handling Area Pool Sweep Exhaust Ventilation RMS	____	1. Starts Control Room Fresh Air Units.
b. Containment and Drywell ventilation exhaust RMS	____	2. Closes Auxiliary Building ventilation suction and discharged valves.
c. Control Building Ventilation RMS	____	3. Provides alarms only.
d. Fuel Handling Area Vent stack monitor (GE monitor)	____	4. Closes Drywell purge exhaust valves.
		5. Isolates mechanical vacuum pump.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 23 (2.00)

Concerning the Electro-Hydraulic System: MATCH the purpose in Column B with the appropriate component in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Speed Controller Circuit	____	1. Controls reactor pressure during all modes of operation by positioning turbine control valves and bypass control valves.
b. Load Reference Controller	____	2. Generator synchronization and initial unit loading to approximately 13% turbine load.
c. Load Reject Relay	____	3. Provides necessary load information and 12% interlock on load control ON/OFF switch, and for automatic load control.
d. Mechanical-Hydraulic Control System (MHC)	____	4. Activate at a load drop of greater than or equal to 35% at a rate of 500% per second.
		5. Operates turbine manually in case EHC fails.
		6. Regulates load on turbine by feeding signals to valve lift controller.

QUESTION: 24 (1.00)

FILL IN THE BLANKS. The LPCS Line break status light is only valid above (a)_____% power and (b)_____% core flow. (1.0)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 25 (2.00)

During reactor operation the offgas post-treatment radiation monitor reaches the High-High-High setpoint.

LIST the FOUR (4) valves in the offgas train that will automatically close, isolating the offgas system. Valve name and/or number is acceptable (2.0)

QUESTION: 26 (2.00)

LIST the FOUR (4) systems monitored by the Process Liquid Radiation Monitoring Subsystem. (2.0)

QUESTION: 27 (1.00)

STATE the TWO (2) sources of motive force available to scram the control rods during normal operation. (1.0)

QUESTION: 28 (1.00)

As Reactor Operator you are walking through Elevation 93 of the Auxiliary Building and find a five gallon bucket of sodium hydroxide spilled on the floor.

WHICH ONE (1) individual must you notify, according to AP-01-S-08-15 "Spill Prevention Control and Countermeasures?" (1.0)

a. Supervisor, Environmental Services

b. Chem/Rad Control Superintendent

c. Shift Superintendent

d. Manager, Plant Operations

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 29 (1.00)

Concerning escort responsibilities for GGNS employees;

WHICH ONE (1) of the following is the maximum number of visitors per escort in the protected area? (1.0)

a. 2

b. 3

c. 5

d. 7

QUESTION: 30 (1.00) delete

An employee must work on exposed and energized electrical equipment powered from a 4160 volt bus. You have been designated by the Control Room Shift Supervisor to be the qualified operator stationed at the isolation device for the equipment involved.

WHICH ONE (1) of the following additional requirements must be present at the electrical equipment work location? (1.0)

a. Control of Hazardous Electrical Energy work procedures.

b. Insulated electrical equipment grounding rod.

c. Rubber insulating mats on floor and surrounding equipment.

d. Direct communications with the control room.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 31 (1.00)

WHICH ONE (1) statement is correct concerning operator licenses in accordance with 02-S-01-7 "Operations Personnel Qualifications" and Technical Specifications "Administrative Controls"? (1.0)

a. A valid operator license is required for an operator to perform a core alteration.

b. STAs are required to be licensed Senior Operators.

c. During Operational Condition 4 or 5, an individual with a valid operator license may be designated to assume the control room command function during the absence of both the Shift Supervisor and the Shift Superintendent from the control room.

d. During core alterations, an individual with a valid operator license may be designated to assume the direct supervision of core alterations during the absence of the Senior Operator providing he has specific written instructions.

QUESTION: 32 (1.00)

WHICH ONE (1) of the following is NOT a responsibility of a Fire Brigade Member in accordance with 01-S-10-1, "Fire Protection Plan"? (1.0)

Fire Brigade Members are responsible for:

a. knowing the locations of potential fire hazards.

b. checking out a Fire Brigade key ring from Security prior to starting shift duties.

c. understanding the effects of fire and fire suppressants on safe shutdown capability.

d. assisting in review of the Fire Protection program as specified in the FSAR.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 33 (1.00)

delete

WHICH ONE (1) of the following concerning minimum crew composition is required by the Technical Specifications? (1.0)

a. A Senior Reactor Operator is required during all operating conditions.

b. One shift crew position may be unmanned upon shift change for up to two hours due to an oncoming shift crewman being late of absent.

c. Two individuals with valid reactor operator licenses are required during Operating Conditions 1, 2 and 3.

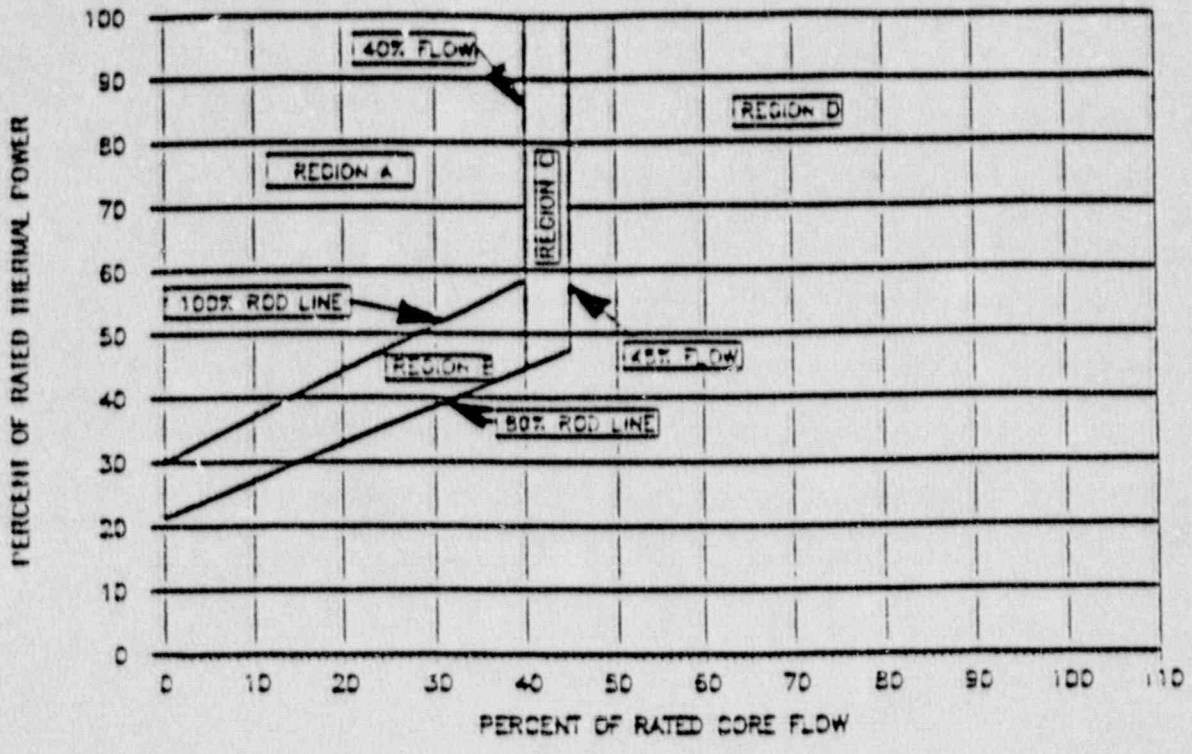
d. An STA may assume Control Room Command function for the Shift Superintendent during Operating Conditions 1, 2 and 3 providing the STA has a valid SRO license.

QUESTION: 34 (1.00)

MATCH the Hydrogen Concentration of Column B with the range definition in Column A. Items in Column B may be used more than once or not at all. (1.0)

Column A		Column B
a. Combustible	____	1. 0 - 4%
b. Explosive or detonable	____	2. 4 - 18%
		3. 18 - 59%
		4. 75 - 100%

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)


PERCENT OF RATED THERMAL POWER
100
90
80
70
60
50
40
30
20
10
0
40% FLOW
REGION D
REGION A
REGION C
100% ROD LINE
REGION B
80% ROD LINE
0
10
20
30
40
50
60
70
80
90
100
110
PERCENT OF RATED CORE FLOW

QUESTION: 35 (2.50)

MATCH the dose limit in Column B with the description in Column A. Items from Column B may be used more than once or not at all. Consider this nonemergency exposure. (2.5)

	Column A		Column B (in mrem)
a.	Maximum administrative guideline per calendar quarter for skin exposure.	____	1. 300
b.	Maximum administrative limit for annual whole body exposure.	____	2. 1000
c.	Federal limit per calendar quarter exposure to extremities-quarterly exposure is known.	____	3. 1250
d.	Federal limit to whole body per calendar quarter if lifetime exposure history is known via Form NRC-4.	____	4. 1500
e.	Federal limit per calendar quarter for skin of whole body-quarterly exposure is known.	____	5. 3000
			6. 4000
			7. 5000
			8. 7500
			9. 15000
			10. 18750

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 36 (1.25)

FILL IN THE BLANKS with the limits that require posting for each of the following areas per 01-S-08-2, "Exposure and Contamination Control."

a. High Radiation Area - Any area, accessible to personnel, in which a major portion of the body could receive in any one hour a dose in excess of _____ mrem. This area shall be posted CAUTION, HIGH RADIATION AREA, Contact HP Before Entry (or similar). (0.25)

b. Very High Radiation Area (locked) - Any area, accessible to personnel, in which a major portion of the body could receive in any one hour a dose in excess of _____ mrem. this area shall be posted CAUTION, VERY HIGH RADIATION AREA, Contact HP Before Entry (or similar). (0.25)

c. Contamination Area - Any area in which loose surface contamination exceeds (1)_____ dpm/100 cm2 beta-gamma or (2)_____ dpm/100 cm2 alpha. This area must be posted with signs stating CAUTION, CONTAMINATION AREA (or similar). A single step-off pad is normally used for access to these areas. (0.5)

d. High Contamination Area - Any area in which loose surface contamination levels exceed _____ dpm/100 cm2 beta-gamma. This area must be posted with signs stating CAUTION, HIGH CONTAMINATION AREA. (0.25)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 37 (1.25)

FILL IN THE BLANKS.
According to Administrative Procedure 01-5-06-2:

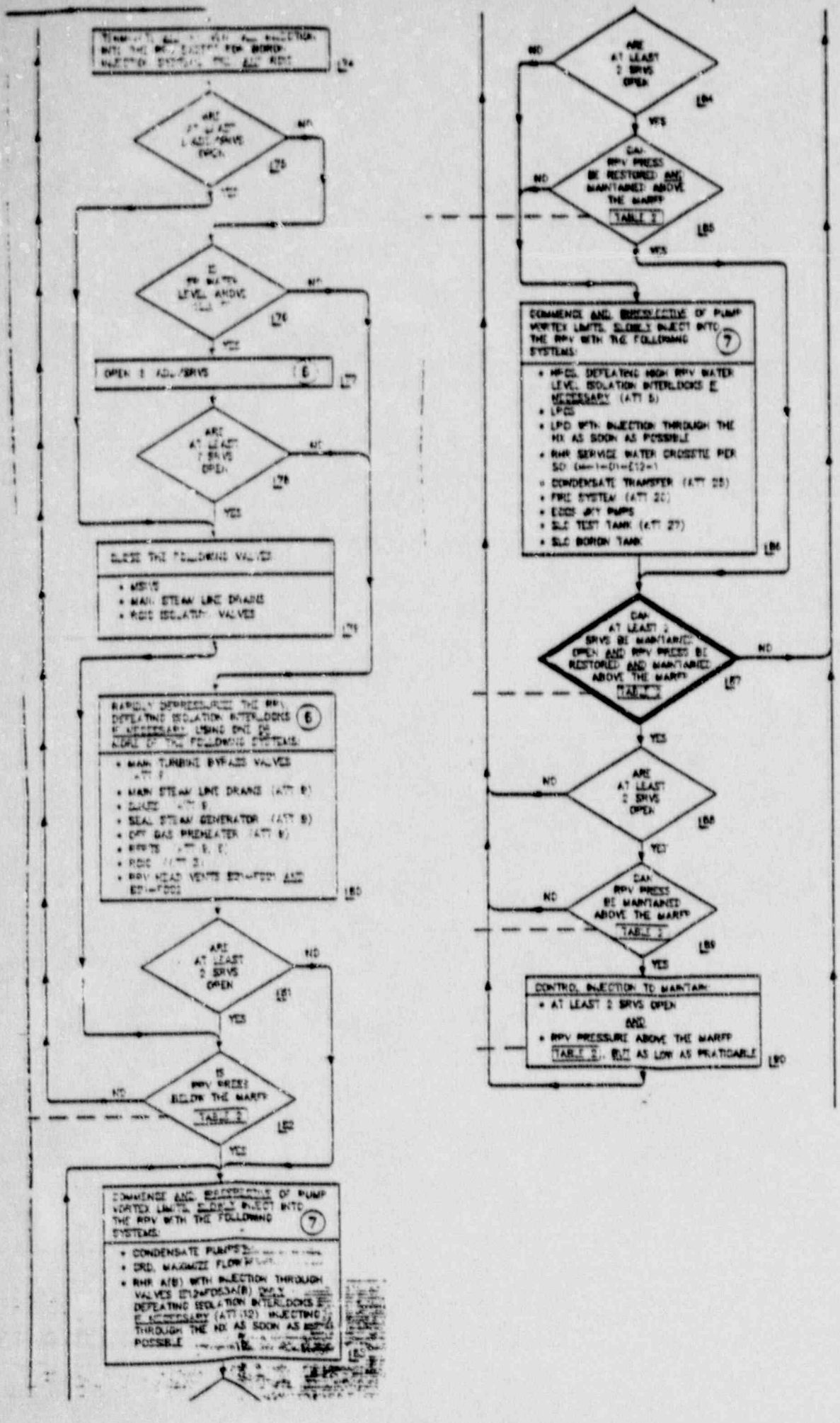
There should be at least a(n) (a)_____ hour break between all work periods, including shift turnover time. (0.25)

An individual should not work more than (b)_____ hour(s) in any 7-day period, excluding shift turnover time. (0.25)

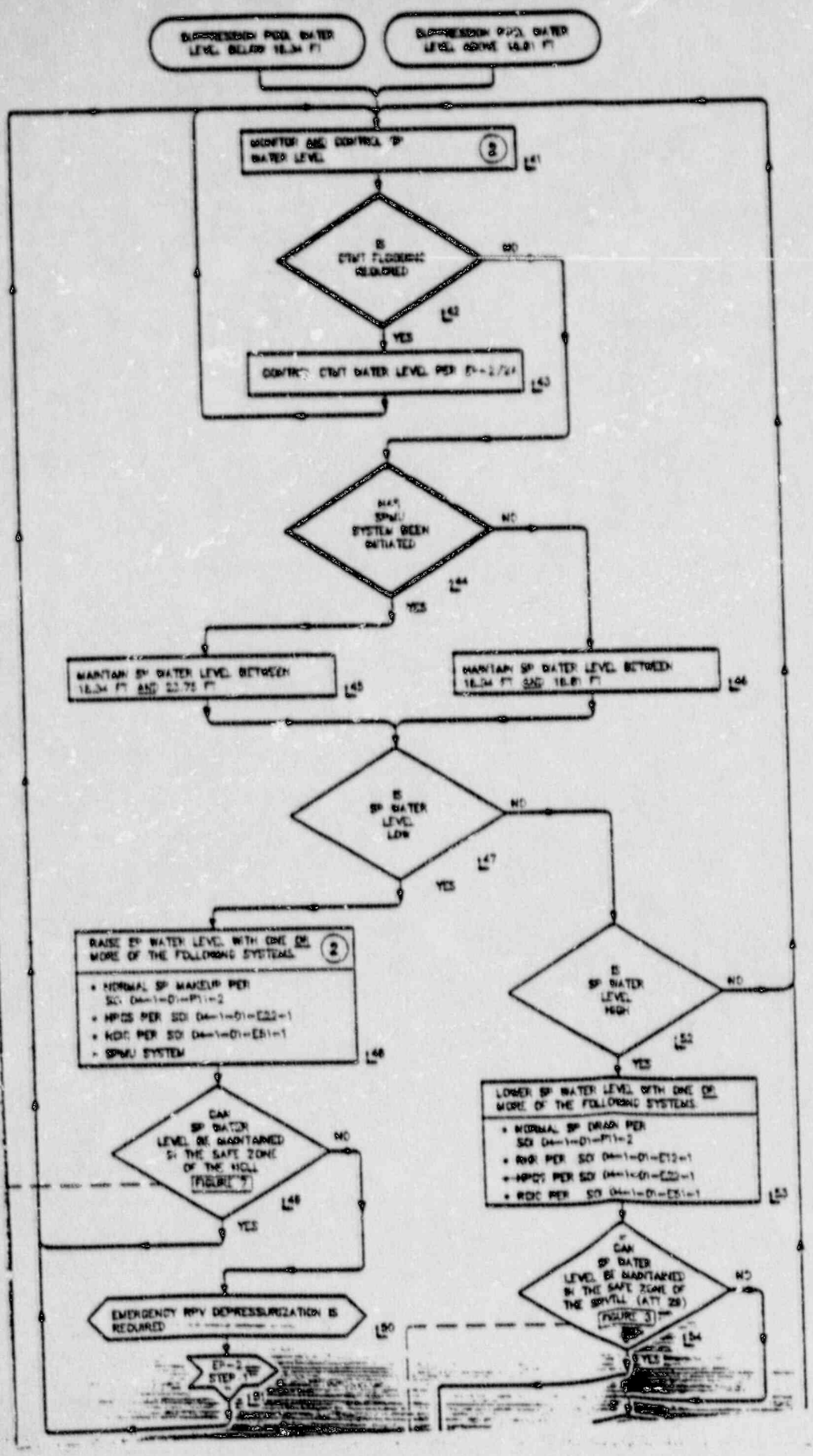
An individual should not work more than (c)_____ hour(s) in any 48-hour period, excluding shift turnover time. (0.25)

An individual should not work more than (d)_____ consecutive hours nor more than (e)_____ hour(s) in any 24-hour period, both of which exclude shift turnover time. (0.5)

(***** END OF CATEGORY 3 *****)
(********** END OF EXAMINATION **********)


NO
YES
OPEN 2 ADS/SRVS
6
CLOSE THE FOLLOWING VALVES
• MSIVS
• MAIN STEAM LINE DRAINS
• RCIC ISOLATION VALVES
RAPIDLY DEPRESSURIZE THE RPV
DEFEATING ISOLATION INTERLOCKS
6
• MAIN TURBINE BYPASS VALVES
• MAIN STEAM LINE DRAINS (ATT 8)
• SEAL STEAM GENERATOR (ATT 8)
• OFF GAS PREHEATER (ATT 8)
• RCIC
• RDC
• RPV HEAD VENTS
ARE AT LEAST 2 SRVS OPEN
IS RPV PRESS BELOW THE MAPP TABLE 2
COMMENCE AND MAINTAIN OF PUMP VORTEX LIMITS SLOWLY INJECT INTO THE RPV WITH THE FOLLOWING SYSTEMS:
7
• CONDENSATE PUMPS
• CRD, MAXIMIZE FLOW
• RHR A(B) WITH INJECTION THROUGH VALVES
DEFEATING ISOLATION INTERLOCKS
THROUGH THE NOZ AS SOON AS
POSSIBLE
ARE AT LEAST 2 SRVS OPEN
CAN RPV PRESS BE RESTORED AND MAINTAINED ABOVE THE MAPP TABLE 2
COMMENCE AND MAINTAIN OF PUMP VORTEX LIMITS SLOWLY INJECT INTO THE RPV WITH THE FOLLOWING SYSTEMS:
7
• HPCS, DEFEATING HIGH RPV WATER LEVEL ISOLATION INTERLOCKS IF NECESSARY (ATT 5)
• LPCS
• LPCI WITH INJECTION THROUGH THE NOZ AS SOON AS POSSIBLE
• RHR SERVICE WATER CROSSTIE PER SO
• CONDENSATE TRANSFER (ATT 25)
• FIRE SYSTEM (ATT 20)
• EDGS JWT PUMPS
• SLC TEST TANK (ATT 27)
• SLC BORON TANK
CAN AT LEAST 2 SRVS BE MAINTAINED OPEN AND RPV PRESS BE RESTORED AND MAINTAINED ABOVE THE MAPP TABLE 2
ARE AT LEAST 2 SRVS OPEN
CAN RPV PRESS BE MAINTAINED ABOVE THE MAPP TABLE 2
CONTROL INJECTION TO MAINTAIN:
• AT LEAST 2 SRVS OPEN
AND
• RPV PRESSURE ABOVE THE MAPP TABLE 2, BUT AS LOW AS PRACTICABLE

SUPPRESSION POOL WATER LEVEL CONTROL



ANSWER: 01 (1.00)

b. [+1.0]

REFERENCE:

1. ONEP 05-1-02-III-3 Rev. 16 pg. 3.
2. KA Numbers 295001K304 (3.4/3.6)

295001K304 ..(KA's)

ANSWER: 02 (1.00)

c. [+1.0]

REFERENCE:

1. ONEP 05-1-02-IV-6 Rev 12 pg.1.
2. KA Numbers, 295006G007 (3.8/4.1)

295006G007 ..(KA's)

ANSWER: 03 (1.00)

b. [+1.0]

REFERENCE:

1. ONEP-05-01-02-V-16 Rev. 14 pg. 1 Section 4.1.
2. KA Numbers 295012G010 (3.8/3.7), 295019G010 (3.7/3.4)

295012G010 295019G010 ..(KA's)

ANSWER: 04 (1.00)

d. [+1.0]

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. ONEP-05-1-2-III-3 Rev. 18 pg. 3 section 4.6.
2. KA Numbers 295001G010 (3.8/3.7), 295001A105 (3.3/3.3).

295001G010 295001A105 ..(KA's)

ANSWER: 05 (1.00)

b. [+1.0]

REFERENCE:

1. ONEP 05-1-02-III-1 Rev. 15, page 2, section 5.1.2.a
2. NPE-OAS Operational Analysis of SEOR 82-2.
3. KA Numbers 295021K301 (3.3/3.4).

295021K301 ..(KA's)

ANSWER: 06 (1.00)

b. [+1.0]

REFERENCE:

1. ONEP-05-1-02-V-1 Rev. 11, pg. 2 section 4.1.2.
2. KA Numbers 295018K202 (3.4/3.6), 295018K303 (3.1/3.3).

295018K202 295018K303 ..(KA's)

ANSWER: 07 (1.00)

c. [+1.0]

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. Alarm Response Instruction 04-1-1H13-P601-19A-A5.
2. KA Numbers 295013G010 (3.8/3.6).

295013G010 ..(KA's)

ANSWER: 08 (1.00)

c. [+1.0]

REFERENCE:

1. EP-2A Step 86 and Caution #7.
2. OP-LO-E-/SPDS-LP-004-03 L.O. #3.
3. KA Numbers 295014A107 (4.0/4.1), 295014G007 (3.3/3.6).

295014A107 295014G007 ..(KA's)

ANSWER: 09 (1.00)

c. [+1.0]

delete

REFERENCE:

1. ONEP-05-1-02-V-4, Rev. 14, page 1.
2. KA Numbers 295007K201 (3.5/3.7).

295007K201 ..(KA's)

ANSWER: 10 (1.00)

d. [+1.0]

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. ONEP-05-1-02-II-3, Rev. 15, page 2, Section 4.0.
2. KA Numbers 295038G010 (3.8/3.6), 295038K203 (3.6/3.8).

295038G010 295038K203 ..(KA's)

ANSWER: 11 (1.00)

d. [+1.0]

REFERENCE:

1. EP-3, Rev. 21, Caution 2.
2. KA Numbers 295030A202 (3.9/3.9).

295030A202 ..(KA's)

ANSWER: 12 (1.00)

d. [+1.0]

REFERENCE:

1. ONEP-05-1-02-II-9, pp. 2-3, Section 4.3.
2. KA Numbers 295023G001 (3.3/3.4).

295023G001 ..(KA's)

ANSWER: 13 (1.00)

d. [+1.0]

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. OP-LO-EP/SPDS-LP-004-03 L.O. #3.
2. KA Numbers 295031K304 (4.0/4.3)

295031K304 ..(KA's)

ANSWER: 14 (2.00)

a. 5

b. 1

c. 1

d. 6

[+0.5 pts each response total 2.0]

REFERENCE:

1. ONEP-05-1-02-III-3, Rev. 18, sections 2.9.4, 4.4 and Fig 1.
2. KA Numbers 295001G011 (3.9/4.2), 295001K102 (3.3/3.5).

295001G011 295001K102 ..(KA's)

ANSWER: 15 ~~(2.00)~~ 1.50

a. 1 [+0.5]

b. 3 [+0.5]

c. 3 [+0.5]

d. 3 [+0.5] delete

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. ONEP-05-1-02-V-9.
2. KA Numbers 295019K203 (3.2/3.3), 295019K207 (3.2/3.2), 295019K205 (3.4/3.4).

295019K203 295019K207 295019K205 ..(KA's)

ANSWER: 16 (2.00)

a. 4

b. 7

c. 6

d. 8

[+0.5 each]

REFERENCE:

1. ONEP 05-1-02-V-8 Immediate Op.Act.
2. KA Numbers 295002K202 (3.1/3.2), 295002K203 (3.5/3.6) 295002K205 (2.7/2.7).

295002K202 295002K203 295002K205 ..(KA's)

ANSWER: 17 (2.50)

a. 1 [+0.5]

b. 2 [+0.5]

c. 3 [+0.5]

d. 4 [+0.5]

e. 1 [+0.5]

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. OP-LO-EP/SPDS-LP-003-03, L.O. #4.
2. OP-LO-EP/SPDS-LP-005-04, L.O. #4.
3. OP-LO-EP/SPDS-LP-006-03, L.O. #4.
4. KA Numbers 295024G011 (4.3/4.5), 295031G011 (4.2/4.6).

295024G011 295031G011 ..(KA's)

ANSWER: 18 (1.00)

a. 0.5% [+0.5]

b. TAF (-167") [+0.5]

REFERENCE:

1. EP-3 "Containment Control"
2. KA Numbers 295031G011 (4.2/4.6)

295031G011 ..(KA's)

ANSWER: 19 (2.00)

1. (Place flow controller in manual and) decrease output to zero.
2. Verify FCV is shut.
3. Start the standby CRD pump.
4. When charging header pressure has returned to normal [+0.25], manually adjust flow controller output (to 54-66 gpm and place in automatic) [+0.25].

[+0.5 each]

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. GGNS: ONEP 05-1-02-IV-1.
2. KA Numbers 295022G010 (3.7/3.5), 295022A101 (3.1/3.2)
   295022K202 (3.1/3.1)

295022G010 295022A101 295022K202 ..(KA's)

ANSWER: 20 (1.00)

a. Close Flow Control Valve to minimum [+0.5]

b. Shift to LFMG [+0.5]

REFERENCE:

1. ONEP-05-1-02-V-1, pg. 3, section 4.2.4.a.
2. KA Numbers 295018K101 (3.5/3.6)

295018K101 ..(KA's)

ANSWER: 21 (1.50)

Verify the scram discharge vent and drain valves are closed [+0.5]
Place the Mode switch to SHUTDOWN [+0.5]
(The parameter is) reactor pressure (indication) [+0.5]

REFERENCE:

1. ONEP 05-1-02-I-1 Rev. 21, page 3 section 4.0
2. KA Numbers 295006G010 (4.1/4.2)

295006G010 ..(KA's)

ANSWER: 22 (2.00)

1. (EMERGENCY) A DC Seal Oil Pump [+0.5]
2. (main) A Turbine DC Lube Oil Pump [+0.5]
3. ~~Both [+0.5] RFPT DC Lube Oil Pumps~~ [+0.5]
   2 Reactor Feed Pump (RFPT) "A" DC Lube Oil Pump
4. Reactor Feed Pump (RFPT) "B" DC Lube Oil Pump

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. ONEP-05-1-02-I-4.
2. KA Numbers 295003K206 (3.4/3.5), 295003G010 (3.9/4.1).

295003K206 295003G010 ..(KA's)

(***** END OF CATEGORY 2 *****)

ANSWER: 01 (1.00)

b. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-F11 Rev. 4. Table 10.
2. KA Numbers 234000A302 (3.1/3.7).

234000A302 ..(KA's)

ANSWER: 02 (1.00)

a. [+1.0]

REFERENCE:

1. ONEP-05-1-02-IV-1.
2. OP-LO-SYS-LP-(11-1A), L.O. #5.
3. KA Numbers 201001K408 (3.1/3.0).

201001K408 ..(KA's)

ANSWER: 03 (1.00)

c. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-C11-1A pg. 20J.
2. KA Numbers 201001K303 (3.1/3.2).

201001K303 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 04 (1.00)

b. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-B21 pg. 22 section C GE SIL NO. 470.
2. KA Numbers 216000A207 (3.4/3.5).

216000A207 ..(KA's)

ANSWER: 05 (1.00)

a. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-C34-02 Figure 1.
2. KA Numbers 259002K604 (3.1/3.1), 259002K605 (3.5/3.5).

259002K604 259002K605 ..(KA's)

ANSWER: 06 (1.00)

d. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-C41-07 pg. 17.
2. KA Numbers 211000K408 (4.2/4.2).

211000K408 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 07 (1.00)

d. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-pg. 81, L.O. #4a.
2. KA Numbers 264000K402(4.0/4.2)

264000K402 ..(KA's)

ANSWER: 08 (1.00)

c. [+1.0]

REFERENCE:

1. OP-Z51-501, Rev. 1 pg. 12.
2. KA Numbers 290003K401 (3.1/3.2)

290003K401 ..(KA's)

ANSWER: 09 (1.00)

d. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-C11-1A pp. 20, Section V.M
2. KA Numbers 201003A209 (3.2/3.4).

201003A209 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 10 (1.00)

a. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-M71 pg. 39, section 18.a.1.
2. KA Numbers 223002K403 (3.5/3.6).

223002K403 ..(KA's)

ANSWER: 11 (1.00)

a. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-T48 pg.17 section VI.G.
2. KA Numbers 288000A301 (3.8/3.8)

288000A301 ..(KA's)

ANSWER: 12 (1.00)

d. [+1.0]

REFERENCE:

1. OP-E32-38-501 Rev 1 pg. 17 section VIII.A.3.
2. KA Numbers 239003K406 (3.1/3.3)

239003K406 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 13 (1.00)

c. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-C51-1 pg. 13, Section IV.
2. KA Numbers 215004K401 (3.7/3.7).

215004K401 ..(KA's)

ANSWER: 14 (2.00)

a. 6 [+0.5]

b. 5 [+0.5]

c. 1 [+0.5]

d. 7 [+0.5]

REFERENCE:

1. OP-LO-SYS-LP-E22-02 L.O. #5.
2. OP-LO-SYS-LP-E12-05 L.O. #5.
3. OP-LO-SYS-LP-P64-04 Table 4, L.O. #3.
4. KA Numbers 205000K402 (3.7/3.8), 286000K402 (3.3/3.5), 218000K501 (3.8/3.8), 203000K401 (4.2/4.2).

205000K402 286000K402 218000K501 203000K401 ..(KA's)

ANSWER: 15 (2.00)

a. 3 [+0.5]

b. 4 [+0.5]

c. 3 [+0.5]

d. 3 [+0.5]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. OP-LO-SYS-LP-E12-05 L.O. #5.C.
2. KA Numbers 205000K401 (3.4/3.4), 205000K402 (3.7/3.8), 205000K403 (3.8/3.8).

205000K401 205000K402 205000K403 ..(KA's)

ANSWER: 16 (1.50)

a. 6 [+0.5 each]

b. 5 [+0.5 each]

c. 2 [+0.5 each]

REFERENCE:

1. GGNS OP-LO-SYS-LP-C34-02, Section VI.
2. KA Numbers 259002K410 (3.4/3.4), 259002K409 (3.1/3.1), 259002K404 (2.9/2.9).

259002K404 259002K409 259002K410 ..(KA's)

ANSWER: 17 ~~(2.00)~~ 1.50

a. 1 [+0.5] delete

b. 4 [+0.5]

c. 3 [+0.5]

d. 3 [+0.5]

REFERENCE:

1. OP-LO-SYS-LP-C11-2, Rev. 1, Section IV.
2. KA Numbers 201005K403 (3.5/3.5), 201005K404 (3.5/3.5).

201005K403 201005K404 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 18 (2.00)

a. 5 [+0.5]

b. 4 [+0.5]

c. 6 [+0.5]

d. ~~16~~ [+0.5]

REFERENCE:

1. OP-B33-2-501-2 pg. 16M, Table 2, Figure 1 & 2.
2. KA Numbers 202002K408 (3.3/3.4), 202002K409 (3.3/3.4), 202002A108 (3.4/3.4).

2020024108 202002K408 202002K409 ..(KA's)

ANSWER: 19 (2.00)

a. 2 [+0.5]

b. 5 [+0.5]

c. 2 [+0.5]

d. 6 [+0.5]

REFERENCE:

1. OP-LO-SYS-LP-E22-1 L.O. #7.
2. KA Numbers 209002K201 (3.2/3.3), 209002K202 (2.8/2.9), 209002K203 (2.8/2.9).

209002K202 209002K203 209002K201 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 20 (2.50)

a. 3 ~~[+0.25]~~ +0.5

b. 6 ~~[+0.25]~~ +0.5

c. 8 ~~[+0.25]~~ +0.5

d. 5 ~~[+0.25]~~ +0.5

e. 1 ~~[+0.25]~~ +0.5

REFERENCE:

1. EP-3 Step L-16, L-17, L-20.
2. OP-LO-SYS-LP-G33/36, L.O. #5a.
3. 03-1-01-1 Rev. 37 pg. 29, TS 3.10.5.
4. OP-LO-SYS-LP-M71, L.O. #4 pp. 16-19.
5. KA Numbers 217000K103 (3.6/3.6), 204000K403 (2.9/2.9), 209002K102 (3.5/3.5), 223002K101 (3.8/3.9).

217000K103 204000K403 209002K102 223002K101 ..(KA's)

ANSWER: 21 (2.00)

a. 1. [+0.5]

b. 5. [+0.5]

c. 2. [+0.5]

d. 4. [+0.5]

REFERENCE:

1. GGNS OP-C11-23, L.O. #6.a and b.b.
2. KA Numbers 201005K103 (3.7/3.7), 201005K104 (3.7/3.7).

201005K103 201005K104 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 22 (2.00)

a. 2 [+0.5]

b. 4 [+0.5]

c. 1 [+0.5]

d. 3 [+0.5]

REFERENCE:

1. OP-LO-SYS-D17, Table 5; L.O. 5.a.2&3.
2. ONEP 05-1-02-II-3 Immediate OP. ACT.
3. KA Numbers 272000K106 (3.2/3.3), 272000K110 (3.4/3.6), 272000K120 (2.8/3.0), 272000K402 (3.7/4.1).

272000K106 272000K110 272000K120 272000K402 ..(KA's)

ANSWER: 23 (2.00)

a. 2 [+0.5]

b. 6 [+0.5]

c. 4 [+0.5]

d. 5 [+0.5]

REFERENCE:

1. OP-LO-SYS-LP-N32-2-03, L.O. #3a.
2. KA Numbers 241000G007 (3.5/3.5), 241000K403 (3.0/3.1), 241000K404 (2.8/2.8).

241000G007 241000K403 241000K404 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 24 (1.00)

(a) 80 [+0.5]

(b) 90 [+0.5]

REFERENCE:

1. OP-LO-SYS-LP-521-04.
2. KA Numbers 209001K113 (2.8/3.0).

209001K113 ..(KA's)

ANSWER: 25 (2.00)

1. IN64-FV-F060,(Off Gas Discharge To Vent.)
2. F054,(Prefilter Inlet Drain.) accept name or number.
3. F034 (A)B,(Condenser Drain.)
4. F023,(Holdup, Line Drain)

[+0.5] each,*valve name or number.

REFERENCE:

1. ONEP 05-1-02-II-2 Immediate Operator Action.
2. KA Numbers 271000K408 (3.1/3.3), 271000A204 (3.7/4.1).

271000K408 271000A204 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 26 (2.00)

1. Stand by service water (SW) System [~~+0.5~~] (loops A and B return line).
2. Component Cooling Water (CCW) System [~~+0.5~~] (return line).
3. (Liquid) Radwaste [~~+0.5~~] (effluent to discharge basin).
4. Alternate Decay Heat Removal System [~~+0.5~~]
5. Plant Service Water (PSW)

[any 4 for 0.5 each 2.0 max]

REFERENCE:

1. OP-LO-SYS-D17 pg. 34.
2. KA Numbers 272000K104 (2.9/2.9), 272000K105 (2.8/3.1).

272000K104 272000K105 ..(KA's)

ANSWER: 27 (1.00)

HCU accumulator [+0.5]
reactor pressure [+0.5]

REFERENCE:

1. OP-C11-1B-501-2 pg. 35, C1 and C4.
2. KA Numbers 201003K404 (3.6/3.7).

201003K404 ..(KA's)

ANSWER: 28 (1.00)

c. [+1.0]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. AP-01-S-08-15, Rev 2.
2. KA Numbers 294001K110 (3.1/3.4).

294001K110 ..(KA's)

ANSWER: 29 (1.00)

c. [1.0]

REFERENCE:

1. AP-01-S-11-10 Rev 11 pg. 43, Section 6.12.2. d and e.
2. KA Numbers 294001K105 (3.2/3.7).

294001K105 ..(KA's)

ANSWER: 30 (1.00)

d. [+1.0]

delete

REFERENCE:

1. AP-01-S-12-5 Rev. 3 pp. 5-6 section 6.3.
2. KA Numbers 294001K107 (3.3/3.6).

294001K107 ..(KA's)

ANSWER: 31 (1.00)

c. [+1.0]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. TS, Section 6, Table 6.2.2-1.
2. 02-S-01-7, Rev. 2, page 4, section 6.2.3
3. KA Numbers 294001A111 (3.3/4.3).

294001A111 ..(KA's)

ANSWER: 32 (1.00)

d. [+1.0]

REFERENCE:

1. 01-S-10-1 Rev. 8, page 4, -NOTE-.
2. KA Numbers 294001K116 (3.5/3.8).

294001K116 ..(KA's)

ANSWER: 33 (1.00)

c. [+1.0]

delete

REFERENCE:

1. T.S. Table 6.2.2.1
2. KA Numbers 294001A103 (2.7/3.7)

294001A103 ..(KA's)

ANSWER: 34 (1.00)

a. 2 [+0.5]

b. 3 [+0.5]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. OP-LO-MCD-LP-009-02 L.O. #8 and #9.
2. KA Numbers 294001K115 (3.4/3.8).

294001K115 ..(KA's)

ANSWER: 35 (2.50)

a. 7

b. 6

c. 10

d. 5

e. 8

[+0.5 each]

REFERENCE:

1. 01-S-08-2.
2. KA Numbers 294001K103 (3.3/3.8).

294001K103 ..(KA's)

ANSWER: 36 (1.25)

a. 100 [+0.25]

b. 1,000 [+0.25]

c. (1) 1,000 [+0.25]
(2) 20 [+0.25]

d. 50,000 [+0.25]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. AP 01-S-08-2 Rev. 20.
2. KA Numbers 294001K104 (3.3/3.6), 294001K105 (3.2/3.7).

294001K104 294001K105 ..(KA's)

ANSWER: 37 (1.25)

(a) 8 [+0.25]

(b) 72 [+0.25]

(c) 24 [+0.25]

(d) 16 [+0.25]

(e) 16 [+0.25]

REFERENCE:

1. Administrative Procedure 01-5-06-2
2. OP-LO-AD-LP-001-05, LO #23
3. KA Numbers 294001A103 (2.7/3.7)

294001A103 ..(KA's)

(***** END OF CATEGORY 3 *****)
(********** END OF EXAMINATION **********)

ENCLOSURE 2b

NRC Official Use Only

MASTER SRO
EXAM & ANSWER KEY

Nuclear Regulatory Commission
Operator Licensing
Examination

This document is removed from
Official Use Only category on
date of examination.

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

FACILITY: Grand Gulf 1

REACTOR TYPE: BWR-GE6

DATE ADMINSTERED: 89/12/18

CANDIDATE:

INSTRUCTIONS TO CANDIDATE:

Points for each question are indicated in parentheses after the question. The passing grade requires at least 80% correct overall. Examination papers will be picked up four and one half (4 1/2) hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	NUMBER CORRECT	CATEGORY
~~32.00~~ 30.5	~~40.00~~ 40.13		EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (43%)
~~48.00~~ 45.5	~~60.00~~ 59.87		PLANT SYSTEMS (40%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (17%)
~~80.00~~ 76.0			OVERALL

_____ % CORRECT OVERALL

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

_____
Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

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

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

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

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

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

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

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

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

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

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

11. If you are using separate sheets, number each answer as to category and number (i.e. Plant Systems # 04, EPE # 10) and skip at least 3 lines between answers to allow space for grading.

12. Write "End of Category " at the end of your answers to a category.

13. Start each category on a new page.

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

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

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

QUESTION: 01 (1.00)

WHICH ONE (1) of the following causes a reactor scram as a result of a recirculation pump shaft seizure, according to ONEP 05-1-02-III-3, "Decrease in Recirculation System Flow Rate?" Assume the Mode Switch is in RUN. (1.0)

a. RPV Low Level

b. RPV High Level

c. RPV High Pressure

d. APRM Flow-biased Thermal Power

QUESTION: 02 (1.00)

WHICH ONE (1) is the correct action if ALL rod position indication is lost, in accordance with ONEP 05-1-02-IV-6, "Loss of RPIS?" (1.0)

a. Suspend control rod movement if nuclear instrumentation does not respond when control rod movement commands are given.

b. Individual control rod movement is limited to single notch movement, gang movement is prohibited.

c. Control rod movement is only allowed by Scram.

d. Positions before and after control rod movement must be verified on process computer printout by a second licensed operator.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

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

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

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

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

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

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

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

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

QUESTION: 03 (1.00)

One recirculation pump has tripped resulting in a decrease in Recirculation System flow rate. WHICH ONE (1) of the following immediate operator actions in accordance with ONEP-05-1-2-III-3 "Decrease in Recirculation System Flow Rate", is required for the affected loop? (1.0)

a. CLOSE the recirculation pump suction valve and place the FCV to minimum (CLOSED) position.

b. CLOSE the recirculation pump discharge valve and place the FCV to the maximum (OPEN) position.

c. CLOSE the recirculation pump suction valve and place the FCV to the maximum (OPEN) position.

d. CLOSE the recirculation pump discharge valve and place the FCV to minimum (CLOSED) position.

QUESTION: 04 (1.00)

The reactor is at 96% power when a complete loss of Component Cooling Water (CCW) occurs.

In accordance with ONEP-05-1-02-V-1, "Loss of Component Cooling Water", WHICH ONE (1) of the following immediate operator actions is required? (1.0)

a. Reduce reactor power to minimize heat load.

b. Manually trip the Recirculation Pumps within one minute.

c. Isolate the Fuel Pool Heat Exchangers.

d. Isolate the Reactor Water Cleanup System.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 05 (1.00)

In accordance with Alarm Response Instruction 04-1-1H13-P601-19A-5A, when an ADS valve is stuck open, WHICH ONE (1) is the correct suppression pool temperature at which the mode switch must be placed in the SHUTDOWN position? (1.0)

a. 95 deg F

b. 105 deg F

c. 110 deg F

d. 120 deg F

QUESTION: 06 (1.00)

In EP-2A, RPV Flooding, if RPV pressure cannot be restored and maintained above MARFP, Minimum Alternate RPV Flooding Pressure, the instruction is to "...Slowly Inject into the RPV...".

WHICH ONE (1) reason is listed in the caution statement for SLOWLY injecting? Reference attachment if desired. (1.0)

a. A rapid increase in injection may induce thermal stresses in the vessel nozzles.

b. Steam formation could cause rapid overpressurization of the RPV.

c. A rapid increase in injection into the RPV may induce a large power excursion.

d. Vortexing and subsequent water hammer may damage injection piping.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

Deleted

QUESTION: 07 (1.00)

At 90% power the following conditions are observed:

- Main turbine control valves closing.
- Bypass valves do not open
- Pressure Controller Failure Annunciator.
- Reactor power and pressure increasing.
- Changeover lights illuminate on BCVs.
- Decreasing main generator output.
- Pressure controller fault light on Panel H13-P680.
- Bypass Aux channel fault illuminate.
- Scram has not occurred

WHICH ONE (1) of the following failures exist? (1.0)

a. Pressure signal is lost to one of the IPC channels.

b. EHC Fluid pressure indicates zero psig.

c. Failure of either of the EHC valve lift controllers.

d. Electrical fault in the bypass valve opening jack.

QUESTION: 08 (1.00)

WHICH ONE (1) below completes the following?

The "Minimum Steam Cooling Water Level" is -197 inches. This is the lowest RPV water level at which the covered portion of the reactor will generate sufficient steam to _____. (1.0)

a. prevent pellet-clad interaction

b. prevent a sustained zirconium water reaction

c. prevent 950 degree F peak center line temperature

d. prevent clad temperature from exceeding 1500 degrees F

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 09 (1.00)

EP-3 "Containment Temperature Control" requires termination of containment sprays if containment pressure is below 1.23 psig. WHICH ONE (1) of the following statements describes the basis for this step? (1.0)

a. Cooling the containment with the containment sprays will drive the RPV saturation temperature below the curve into the unsafe region and make level instrumentation inaccurate.

b. Since isolations in the secondary containment may have occurred, Technical Specification limit 3.6.1.7 of -0.1 to 1.0 psid between the Containment and Auxiliary Building cannot be assured, jeopardizing the Auxiliary Building.

c. Continuous operation of the containment sprays will increase the Heat capacity Temperature Limit (HCTL) which reduces the Heat Capacity Level Limit (HCLL). Subsequent Emergency Depressurization may be required to stay in the safe region of the HCLL.

d. 1.23 psig is used because it is an easy number for the operator to remember. Terminating containment spray at this pressure avoids containment failure due to negative pressure.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 10 (1.00)

WHICH ONE (1) of the following is the basis for Technical Specification 3.6.1.8 which states that containment average air temperature shall not exceed 90 deg F?

a. Ensures that mechanical equipment in the containment does not degrade due to high temperature during the design life of the plant.

b. Ensures that electrical components in the containment do not degrade due to high temperature during the design life of the plant.

c. Ensures personnel access to the safety related equipment in the containment without risk of heat stress.

d. Ensures that the containment peak air temperature during a LOCA does not exceed the design temperature of the containment.

QUESTION: 11 (1.00)

WHICH ONE (1) event would result in the greatest estimated whole body dose at the site boundary? Base your answer on the FSAR calculations. (1.0)

a. Fuel Handling Accident (drop) In Aux Bldg.

b. Fuel Handling Accident Inside Containment

c. Offgas Failure

d. LOCA, Recirculation Line Suction Break

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 12 (2.00)

The reactor is at 75% rated thermal power when a failure occurs in the Recirculation system.

In accordance with ONEP-05-1-02-III-3 "Decrease in Recirculation System Flow Rate", MATCH the immediate operator actions in Column B with the plant operating conditions given in Column A. Items in Column B may be used more than once or not at all. Attached is a GGNS power to flow map. (2.0)

	Column A			Column B actions
	% of thermal pwr	/	% of rated flow	
a.	50	/	22	1. Reduce thermal power by inserting control rods to within Region ~~B~~, D
b.	50	/	33	
c.	55	/	42	2. Increase thermal power by withdrawing control rods to within Region D.
d.	60	/	48	
				3. Reduce core flow to to within Region B.
				4. Trip both recirculation pumps to OFF.
				5. Scram the reactor.
				6. No Action required.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 13 (2.00)

While operating at full power, the plant experiences a total loss of Instrument Air.

MATCH the failure mode in Column B with the components in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. CRD Flow Control valves	____	1. Fails as is
b. Main Steam Isolation valves (MSIV)	____	2. Fails open
c. Feedwater startup flow control valve.	____	3. Fails closed
d. Main Steam line drain valves.	____	4. Not Affected

deleted

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 14 (2.00)

MATCH the correct Main Condenser Vacuum setpoint in Column B with action/trip in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Turbine Trip	____	1. 27" Hg vac
b. Main Steam Bypass Valve Closes	____	2. 25" Hg vac
c. Reactor Feed Pump Trip	____	3. 23" Hg vac
d. Group I isolation	____	4. 21" Hg vac
		5. 19" Hg vac
		6. 16" Hg vac
		7. 12" Hg vac
		8. 9" Hg vac

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 15 (2.50)

MATCH the correct Emergency Operating Procedure that should be entered in Column B with the condition in Column A. Items in Column B may be used more than once or not at all. (2.5)

Column A		Column B
a. Reactor pressure of 1040 psig	____	1. None
b. RPV water level at 9.4"	____	2. EP-2 "RPV Control"
c. Suppression pool average temperature at 105 deg F	____	3. EP-3 "Primary Containment Control"
d. Area radiation levels greater than the maximum normal operating levels	____	4. EP-4 "~~Secondary Containment~~ and Radioactive Release Control" Auxilliary Bldg
e. Primary containment or drywell hydrogen concentration at 0.4%	____	

QUESTION: 16 (1.00)

FILL IN THE BLANKS. According to EP-3 "Containment Control", start the hydrogen ignitors if any of the following conditions exist.

a. Hydrogen concentration reaches _____. (0.5)

b. RPV water level drops to _____. (0.5)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 17 (2.00)

LIST the immediate operator actions required to place the standby CRD pump in service following a trip of the operating CRD pump, in accordance with ONEP-05-1-02-IV-1, "Control Rod/Drive Malfunctions." (2.0)

QUESTION: 18 (1.00)

A PARTIAL loss of Component Cooling Water has occurred. You are monitoring the Reactor Recirculation System.

STATE the immediate operator action per ONEP-05-1-02-V-1 "Loss of Component Cooling Water", for EACH of the following operating conditions.

a. The Reactor Recirculation pump and motor temperatures both show an increase of 4 degrees F. (0.5)

b. The high temperature alarm comes in for the Reactor Recirculation pump. (0.5)

QUESTION: 19 (1.50)

A reactor scram has occurred and you have performed the following immediate operator actions:

- Verified all control rods are fully inserted.
- Verified power decreasing.

STATE the remaining immediate operator action(s) AND the specific parameter(s) that must be observed while performing those action(s) in accordance with ONEP-05-1-02-I-1, "Reactor Scram". (1.5)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 20 (2.00)

Given a total loss of AC power, STATE the FOUR (4) BOP pumps that the operator should start or verify have autostarted per ONEP 05-1-02-I-4, "Loss of AC Power". (2.0)

QUESTION: 21 (1.00)

STATE the basis for EACH of the following Technical Specification Limiting Conditions for Operation concerning refueling.

a. TS 3.9.4: The reactor shall be subcritical for at least 24 hours. (0.5)

b. TS 3.9.8: At least 22 feet 8 inches of water shall be maintained over the top of the reactor pressure vessel flange. (0.5)

QUESTION: 22 (1.00)

STATE the cause of the reactor scram initiated by EACH of the following losses of AC power. (Assume Power Level = 100% and no plant equipment is out of service.)

a. Loss of Grid Connections (0.5)

b. Loss of Bus 14AE (0.5)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION: 23 (3.00)

STATE the plant parameters which are utilized for EACH of the following curves in EP-2 "RPV Control" and EP-3 "Containment Control".

a. RPV Saturation Temperature (RPVST) (1.0)

b. Heat Capacity Temperature Limit (HCTL) (1.0)

c. SRV Tailpipe Level Limit (SRVTLL) (1.0)

(***** END OF CATEGORY 5 *****)

QUESTION: 01 (1.00)

WHICH ONE (1) of the following refueling conditions will result in a rod block with the Mode switch in the REFUEL position? (1.0)

a. The refueling platform is positioned over the reactor core and one control rod is withdrawn.

b. The refueling platform is positioned over the reactor core and the main hoist fuel grapple is loaded.

c. The refuel platform is positioned away from the reactor core and the main hoist fuel grapple is loaded.

d. The refueling platform is positioned away from the reactor core and one control rod is withdrawn.

QUESTION: 02 (1.00)

A reactor scram has occurred following a recirculation loop suction line LOCA. The STA has determined that you are in the unsafe region of the RPVST curve of EP-2, "RPV Control".

WHICH ONE (1) of the following statements correctly describes the relationship between indicated and actual reactor vessel level? Assume vessel level is above TAF. (1.0)

a. Actual reactor vessel water level LESS than indicated due to variable leg flashing.

b. Actual reactor vessel water level LESS than indicated due to reference leg flashing.

c. Actual reactor vessel water level GREATER than indicated due to reference leg flashing.

d. Actual reactor vessel water level GREATER than indicated due to variable leg flashing.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 03 (1.00)

WHICH ONE (1) of the following interlocks will PREVENT a Standby Liquid Control Pump from starting when initiated from the Control Room? (1.0)

a. Failure of the Electrically Activated Explosive (SQUIB) Valve to detonate.

b. Incomplete isolation of the Reactor Water Cleanup (RWCU) system.

c. Complete loss of instrument air to SLC.

d. Suction valve from SLC storage tank closed.

QUESTION: 04 (1.00)

WHICH ONE (1) trip function remains active (i.e. NOT BYPASSED) when the Division III Emergency Diesel Generator is operating on a valid LOCA initiation signal? (1.0)

a. Generator overcurrent with voltage restraint

b. Low lube oil pressure

c. High jacket water temperature

d. Differential Current

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 05 (1.00)

WHICH ONE (1) of the following signals will result in an isolation of the Control Room ventilation system? Assume the ventilation keylock handswitch is in AUTO. (1.0)

a. High Freon concentration (150 ppm)

b. High Chlorine Gas concentration (5 ppm)

c. High-High radiation level (5 mR/hr)

d. High Freon AND a smoke detector signal

QUESTION: 06 (1.00)

A LPRM UPSCALE Alarm is received at the Operators Control Console. A LPRM malfunction is suspected.

WHICH ONE (1) of the following actions would verify the LPRM malfunction? (1.0)

a. The LPRM malfunction could be verified by running a TIP trace.

b. The LPRM malfunction could be verified by comparing it to its symmetrical counterparts in the other quadrants.

c. The LPRM malfunction could be verified by comparing it to its associated APRM output.

d. The LPRM malfunction could be verified by running a neutron to gamma signal ratio test.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 07 (1.00)

WHICH ONE (1) of the following actions will occur as a result of a Standby Gas Treatment (SBGT) initiation? (1.0)

a. All the ventilation dampers which isolate the Auxiliary Building will close.

b. All the ventilation dampers which isolate the Control room will close.

c. All the ventilation dampers which isolate the Enclosure Building will close.

d. All the ventilation dampers which isolate the Radwaste Building will close.

QUESTION: 08 (1.00)

WHICH ONE (1) analysis of the boron bearing solution meets Technical Specifications for the Standby Liquid Control system subsystem? Technical Specifications provided. (1.0)

a.	Boron Concentration (wt%)	13%
	Volume	4630 gallons
	Temperature	110 deg F
b.	Boron Concentration (wt%)	16%
	Volume	4510 gallons
	Temperature	112 deg F
c.	Boron Concentration (wt%)	20%
	Volume	4540 gallons
	Temperature	100 deg F
d.	Boron Concentration (wt%)	24%
	Volume	4590 gallons
	Temperature	60 deg F

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 09 (2.00)

MATCH the correct setpoint in Column B with the event/interlock in Column A. Setpoints in Column B may be used more than once or not at all. (2.0)

	Column A		Column B
a.	LPCI low pressure permissive input to ADS.	_____	1. 475 psig
b.	Shutdown cooling isolation.	_____	2. 400 psig
c.	Permissive for manual operation of LPCI inboard injection valve.	_____	3. 250 psig
d.	RCIC low steam pressure isolation.	_____	4. 150 psig
			5. 135 psig
			6. 125 psig
			7. 60 psig

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 10 (2.00)

MATCH the correct setpoints from Column B with the RHR system isolations of Column A. Items from Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. RHR shutdown cooling valves and head spray valves isolate.	____	1. High Drywell pressure (1.39 psig)
b. Control Solenoid valves to radwaste discharge valve (F203) isolate.	____	2. High RHR equipment area temperature (99 degrees F)
c. Sample lines (F060A/B and and F075A/B), RHR Shutdown Cooling upper pool valve F037A/B) isolate.	____	3. Vessel water level below +11.4 inches
d. Discharge to radwaste isolation valves (F040 and F049) isolate.	____	4. Vessel water level below -41.6 inches
		5. Vessel water level below -150.3 inches

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 11 (1.50)

MATCH the action/function from Column B with the operating modes in Column A. Items in Column B may be used more than once or not at all. (1.5)

Column A		Column B
a. Setpoint Setdown Mode	_____	1. Maximizes reactor steam carry over and carry under.
b. Single Element Mode	_____	2. Anticipates level changes resulting from changes in feedflow and steam flow.
c. Three-element Automatic	_____	3. Manually controls level with Startup Level controller.
		4. Controls RFPT speed in the event the Electronic Automatic Position (EAP) "Locks Up".
		5. Used at low steam and feed flows (less than 40%).
		6. Automatically initiated when reactor level reaches +11.4".

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 12 (2.00)

MATCH the rod block type from Column B with the RC&IS conditions in Column A. Items in Column B may be used more than once or no at all.

(2.0)

Deleted

Column A		Column B
a. One rod selected and driving	____	1. Select Block
b. Rod Pattern Controller sequence violation (greater that 20% power)	____	2. Insert Block
		3. Withdrawal Block
c. IRM wrong position, detector not full in while in SHUTDOWN mode	____	4. No Rod Block
d. IRM range 2 and SRM downscale	____	

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 13 (2.00)

MATCH the correct Recirculation Flow Control Valve (FCV) response from Column B with the operating conditions from Column A. Assume the Recirculation Pumps are in fast speed. Items in Column B may be used more than once or not at all. (2.0)

Column A (Condition)		Column B (Flow Control Valve (FCV) Response)
a. Reactor water level DECREASES to level 4 and less than two feedwater pumps are running.	____	1. FCV limited to 102.5% drive flow MAXIMUM.
b. Position Controller demand signal at zero percent indicated position).	____	2. FCV limited to 40% drive flow MINIMUM.
c. Drywell pressure INCREASES to HIGH DRYWELL PRESSURE (1.23 psig).	____	3. FCV at 40% open position (actual).
d. Hydraulic Power Unit (HPU) failure due to undervoltage condition.	____	4. FCV at 20% open position (actual).
		5. FCV runback.
		6. FCV motion inhibit.
		7. No FCV response.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 14 (2.00)

MATCH the correct power supply in Column B with the HPCS equipment in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Power to HPCS pump breaker control logic.	____	1. 120 VAC
b. Power to HPCS injection valve.	____	2. 125 VDC
c. Power to HPCS initiation control logic.	____	3. 125 VAC
d. Power to HPCS pump.	____	4. 250 VDC
		5. 480 VAC
		6. 4160 VAC
		7. 6900 VAC

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 15 (2.50)

MATCH the setpoint in Column B with the event/interlock in Column A. Setpoints in Column B may be used more than once or not at all. (2.5)

Column A		Column B
a. Maximum suppression pool temperature while operating RCIC, per EP-3 "Containment Control."	____	1. 101 deg F 2. 125 deg F
b. CCW pump cooling water temperature to trip Reactor Water Cleanup pumps.	____	3. 140 deg F 4. 175 deg F
c. Maximum suppression pool temperature while operating HPCS, LPCS and RHR in the LPCI mode.	____	5. 185 deg F 6. 195 deg F
d. Group 1 isolation setpoint for Main Steam Line ambient High temperature	____	7. 200 deg F 8. 212 deg F
e. Group 1 isolation setpoint for Main Steam Line ventilation differential high temperature.		9. 220 deg F

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 16 (2.00)

MATCH the correct condition from Column B with the correct indication on P680 panel from Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Channel Disagree	_____	1. The RGDS finds disagreement between signals received from the two RACS.
b. Data Fault	_____	
c. Insert Required	_____	2. The selected rod must be fully inserted before any other control rod can be moved.
d. Scram Valves	_____	
		3. The selected rod must be inserted until reed switch pairs are in agreement.
		4. All scram valves are not in the same position.
		5. More than one reed switch closed (per RPIS channel) (except full in/full out).
		6. The RACS disagrees with the indicated scram valve position.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 17 (2.00)

Relative to the Radiation Monitoring System:

MATCH the correct action in Column B resulting from initiation/isolation signals with the radiation monitoring equipment in Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Fuel Handling Area Pool Sweep Exhaust Ventilation RMS	____	1. Starts Control Room Fresh Air Units.
b. Containment and Drywell ventilation exhaust RMS	____	2. Closes Auxiliary Building ventilation suction and discharged valves.
c. Control Building Ventilation RMS	____	3. Provides alarms only.
d. Fuel Handling Area Vent stack monitor (GE monitor)	____	4. Closes Drywell purge exhaust valves.
		5. Isolates mechanical vacuum pump.

QUESTION: 18 (2.00)

During reactor operation the offgas post-treatment radiation monitor reaches the High-High-High setpoint.

LIST the FOUR (4) valves in the offgas train that will automatically close, isolating the offgas system. (2.0)

QUESTION: 19 (2.00)

LIST the FOUR (4) systems monitored by the Process Liquid Radiation Monitoring Subsystem. (2.0)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 20 (1.00)

STATE the TWO (2) sources of motive force available to scram the control rods during normal operation. (1.0)

QUESTION: 21 (1.00)

As Reactor Operator you are walking through Elevation 93 of the Auxiliary Building and find a five gallon bucket of sodium hydroxide spilled on the floor.

WHICH ONE (1) individual must you notify, according to AP-01-S-08-15 "Spill Prevention Control and Countermeasures?" (1.0)

a. Supervisor, Environmental Services

b. Chem/Rad Control Superintendent

c. Shift Superintendent

d. Manager, Plant Operations

QUESTION: 22 (1.00)

Concerning escort responsibilities for GGNS employees;

WHICH ONE (1) of the following is the maximum number of visitors per escort in the protected area? (1.0)

a. 2

b. 3

c. 5

d. 7

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 23 (1.00)

An employee must work on exposed and energized electrical equipment powered from a 4160 volt bus. You have been designated by the Control Room Shift Supervisor to be the qualified operator stationed at the isolation device for the equipment involved.

WHICH ONE (1) of the following additional requirements must be present at the electrical equipment work location? (1.0)

a. Control of Hazardous Electrical Energy work procedures.

b. Insulated electrical equipment grounding rod.

c. Rubber insulating mats on floor and surrounding equipment.

d. Direct communications with the control room.

QUESTION: 24 (1.00)

WHICH ONE (1) statement is correct concerning operator licenses in accordance with O2-S-01-7 "Operations Personnel Qualifications" and Technical Specifications "Administrative Controls"? (1.0)

a. A valid operator license is required for an operator to perform a core alteration.

b. STAs are required to be licensed Senior Operators.

c. During Operational Condition 4 or 5, an individual with a valid operator license may be designated to assume the control room command function during the absence of both the Shift Supervisor and the Shift Superintendent from the control room.

d. During core alterations, an individual with a valid operator license may be designated to assume the direct supervision of core alterations during the absence of the Senior Operator providing he has specific written instructions.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

Deleted

QUESTION: 25 (1.00)

WHICH ONE (1) of the following concerning minimum crew composition is required by the Technical Specifications? (1.0)

a. A Senior Reactor Operator is required during all operating conditions.

b. One shift crew position may be unmanned upon shift change for up to two hours due to an oncoming shift crewman being late of absent.

c. Two individuals with valid reactor operator licenses are required during Operating Conditions 1, 2 and 3.

d. An STA may assume Control Room Command function for the Shift Superintendent during Operating Conditions 1, 2 and 3 providing the STA has a valid SRO license.

QUESTION: 26 (1.00)

MATCH the Hydrogen Concentration of Column B with the range definition in Column A. Items in Column B may be used more than once or not at all. (1.0)

Column A		Column B
a. Combustible	____	1. 0 - 4%
b. Explosive or detonable	____	2. 4 - 18%
		3. 18 - 59%
		4. 75 - 100%

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 27 (2.50)

MATCH the dose limit in Column B with the description in Column A. Items from Column B may be used more than once or not at all. Consider this nonemergency exposure. (2.5)

	Column A		Column B (in mrem)
a.	Maximum administrative guideline per calendar quarter for skin exposure.	____	1. 300
b.	Maximum administrative limit for annual whole body exposure.	____	2. 1000
c.	Federal limit per calendar quarter exposure to extremities-quarterly exposure is known.	____	3. 1250
d.	Federal limit to whole body per calendar quarter if lifetime exposure history is known via Form NRC-4.	____	4. 1500
e.	Federal limit per calendar quarter for skin of whole body-quarterly exposure is known.	____	5. 3000
			6. 4000
			7. 5000
			8. 7500
			9. 15000
			10. 18750

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 28 (2.00)

MATCH the definitions in Column B with the event classifications of Column A. Items in Column B may be used more than once or not at all. (2.0)

Column A		Column B
a. Unusual Event	____	1. The occurrence of an event or events which involve actual or likely major failures of the plant functions needed for the protection of the public.
b. Alert	____	
c. Site Area Emergency	____	2. The occurrence of an event or events which indicate a POTENTIAL degradation of the level of safety of the plant
d. General Emergency	____	3. The possibility exists of an event or events which indicate a failure of a major plant function needed for the protection of the public.
		4. The occurrence of an event or events which involve actual or imminent substantial core degradation or melting with the potential for loss of containment integrity and substantial releases of large amounts of radioactive material off-site.
		5. The occurrence of an event or events which involve an actual or potential SUBSTANTIAL degradation of the level of safety of the plant.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 29 (3.00)

MATCH the events of Column A with the event classifications of Column A. Items in Column B can be used more than once or not at all. Reference the attached Emergency Plan matrix if desired. (3.0)

Column A		Column B
a. A plant shutdown is commenced when a blowout panel in the Auxiliary Bldg. is found to be open.	____	1. Unusual Event
b. For the last hour radiation monitoring teams at the site boundary have been reporting 600-700 mR/hr whole body Exposure.	____	2. Alert
c. Total loss of offsite power and loss of ALL divisional diesels for 5 minutes.	____	3. Site Area Emergency
d. Loss of Division 1,2, and 3 ESF ~~124~~ 125 vdc for 10 minutes.	____	4. General Emergency
e. Fire destroys Division 1 and 2 ESF.	____	
f. Pressure boundary is leaking but known to be less than 30 gpm.	____	

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 30 (1.25)

FILL IN THE BLANKS with the limits that require posting for each of the following areas per 01-S-08-2, "Exposure and Contamination Control."

a. High Radiation Area - Any area, accessible to personnel, in which a major portion of the body could receive in any one hour a dose in excess of _____ mrem. This area shall be posted CAUTION, HIGH RADIATION AREA, Contact HP Before Entry (or similar). (0.25)

b. Very High Radiation Area (locked) - Any area, accessible to personnel, in which a major portion of the body could receive in any one hour a dose in excess of _____ mrem. this area shall be posted CAUTION, VERY HIGH RADIATION AREA, Contact HP Before Entry (or similar). (0.25)

c. Contamination Area - Any area in which loose surface contamination exceeds (1)_____ dpm/100 cm2 beta-gamma or (2)_____ dpm/100 cm2 alpha. This area must be posted with signs stating CAUTION, CONTAMINATION AREA (or similar). A single step-off pad is normally used for access to these areas. (0.5)

d. High Contamination Area - Any area in which loose surface contamination levels exceed _____ dpm/100 cm2 beta-gamma. This area must be posted with signs stating CAUTION, HIGH CONTAMINATION AREA. (0.25)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION: 31 (1.25)

FILL IN THE BLANKS.
According to Administrative Procedure 01-5-06-2:

There should be at least a(n) (a)_____ hour break between all work periods, including shift turnover time. (0.25)

An individual should not work more than (b)_____ hour(s) in any 7-day period, excluding shift turnover time. (0.25)

An individual should not work more than (c)_____ hour(s) in any 48-hour period, excluding shift turnover time. (0.25)

An individual should not work more than (d)_____ consecutive hours nor more than (e)_____ hour(s) in any 24-hour period, both of which exclude shift turnover time. (0.5)

QUESTION: 32 (1.00)

Administrative Procedure 01-S-02-1, "Description and Use of the GGNS Operations Manual', states:

"IN CASES OF EMERGENCY, plant personnel are authorized to deviate from approved procedures where necessary to prevent injury to personnel, the public, or damage to the facility."

10CFR50.54 lists two exceptions to this statement, one exception during an emergency is departure from a Technical Specification.

a. STATE the other emergency exception. (0.5)

b. STATE who must approve prior to taking the action. (0.5)

(***** END OF CATEGORY 6 *****)
(********** END OF EXAMINATION **********)

ANSWER: 01 (1.00)

b. [+1.0]

REFERENCE:

1. ONEP 05-1-02-III-3 Rev. 16 pg. 3.
2. KA Numbers 295001K304 (3.4/3.6)

295001K304 ..(KA's)

ANSWER: 02 (1.00)

c. [+1.0]

REFERENCE:

1. ONEP 05-1-02-IV-6 Rev 12 pg.1.
2. KA Numbers, 295006G007 (3.8/4.1)

295006G007 ..(KA's)

ANSWER: 03 (1.00)

d. [+1.0]

REFERENCE:

1. ONEP-05-1-2-III-3 Rev. 18 pg. 3 section 4.6.
2. KA Numbers 295001G010 (3.8/3.7), 295001A105 (3.3/3.3).

295001G010 295001A105 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER: 04 (1.00)

b. [+1.0]

REFERENCE:

1. ONEP-05-1-02-V-1 Rev. 11, pg. 2 section 4.1.2.
2. KA Numbers 295018K202 (3.4/3.6), 295018K303 (3.1/3.3).

295018K303 295018K202 ..(KA's)

ANSWER: 05 (1.00)

c. [+1.0]

REFERENCE:

1. Alarm Response Instruction 04-1-1H13-P601-19A-A5.
2. KA Numbers 295013G010 (3.8/3.6).

295013G010 ..(KA's)

ANSWER: 06 (1.00)

c. [+1.0]

REFERENCE:

1. EP-2A Step 86 and Caution #7.
2. OP-LO-E-/SPDS-LP-004-03 L.O. #3.
3. KA Numbers 295014A107 (4.0/4.1), 295014G007 (3.3/3.6).

295014A107 295014G007 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER: 07 (1.00)

c. [+1.0] Deleted

REFERENCE:

1. ONEP-05-1-02-V-4, Rev. 14, page 1.
2. KA Numbers 295007K201 (3.5/3.7).

295007K201 ..(KA's)

ANSWER: 08 (1.00)

d. [+1.0]

REFERENCE:

1. OP-LO-EP/SPDS-LP-004-03 L.O. #3.
2. KA Numbers 295031K304 (4.0/4.3)

295031K304 ..(KA's)

ANSWER: 09 (1.00)

d. [+1.0]

REFERENCE:

1. EP-3 step 18.
2. OP-LO-EP-SPDS-LP-005-04 L.O. #3.
3. KA Numbers 295011K301(3.6/3.9)

295011K301 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER: 10 (1.00)

d. [+1.0]

REFERENCE:

1. T.S. 3.6.1.8 and Basis.
2. KA Numbers 295027G004 (3.0/4.1), 295027K103 (3.8/3.8).

295027K103 295027G004 ..(KA's)

ANSWER: 11 (1.00)

d. [+1.0]

REFERENCE:

1. OP-LO-DT-LP-017-2 L.O. #1.
2. OP-LO-DT-LP-024-1 L.O. #2.
3. OP-LO-DT-LP-025-1 L.O. #3.
4. OP-LO-DT-LP-028-1 L.O. #1.
5. KA Numbers 295038A201 (3.3/4.3).

295038A201 ..(KA's)

ANSWER: 12 (2.00)

a. 5

b. 1

c. 1

d. 6

[+0.5 pts each response total 2.0]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. ONEP-05-1-02-III-3, Rev. 18, sections 2.9.4, 4.4 and Fig 1.
2. KA Numbers 295001G011 (3.9/4.2), 295001K102 (3.3/3.5).

295001G011 295001K102 ..(KA's)

ANSWER: 13 ~~(2.00)~~ 1.5

a. 1 [+0.5]

b. 3 [+0.5]

c. 3 [+0.5]

d. 3 [+0.5] Deleted

REFERENCE:

1. ONEP-05-1-02-V-9.
2. KA Numbers 295019K203 (3.2/3.3), 295019K207 (3.2/3.2), 295019K205 (3.4/3.4).

295019K203 295019K207 295019K205 ..(KA's)

ANSWER: 14 (2.00)

a. 4

b. 7

c. 6

d. 8

[+0.5 each]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. ONEP 05-1-02-V-8 Immediate Op.Act.
2. KA Numbers 295002K202 (3.1/3.2), 295002K203 (3.5/3.6) 295002K205 (2.7/2.7).

295002K202 295002K203 295002K205 ..(KA's)

ANSWER: 15 (2.50)

a. 1 [+0.5]

b. 2 [+0.5]

c. 3 [+0.5]

d. 4 [+0.5]

e. 1 [+0.5]

REFERENCE:

1. OP-LO-EP/SPDS-LP-003-03, L.O. #4.
2. OP-LO-EP/SPDS-LP-005-04, L.O. #4.
3. OP-LO-EP/SPDS-LP-006-03, L.O. #4.
4. KA Numbers 295024G011 (4.3/4.5), 295031G011 (4.2/4.6).

295024G011 295031G011 ..(KA's)

ANSWER: 16 (1.00)

a. 0.5% [+0.5]

b. TAF (-157") [+0.5]

REFERENCE:

1. EP-3 "Containment Control"
2. KA Numbers 295031G011 (4.2/4.6)

295031G011 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER: 17 (2.00)

1. (Place flow controller in manual and) decrease output to zero.

2. Verify FCV is shut.

3. Start the standby CRD pump.

4. When charging header pressure has returned to normal [+0.25], manually adjust flow controller output (to 54-66 gpm and place in automatic) [+0.25].

[+0.5 each]

REFERENCE:

1. GGNS: ONEP 05-1-02-IV-1.
2. KA Numbers 295022G010 (3.7/3.5), 295022A101 (3.1/3.2) 295022K202 (3.1/3.1)

295022G010 295022A101 295022K202 ..(KA's)

ANSWER: 18 (1.00)

a. Close Flow Control Valve to minimum [+0.5]

b. Shift to LFMG [+0.5]

REFERENCE:

1. ONEP-05-1-02-V-1, pg. 3, section 4.2.4.a.
2. KA Numbers 295018K101 (3.5/3.6)

295018K101 ..(KA's)

ANSWER: 19 (1.50)

Verify the scram discharge vent and drain valves are closed [+0.5]
Place the Mode switch to SHUTDOWN [+0.5]
(The parameter is) reactor pressure (indication) [+0.5]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. ONEP 05-1-02-I-1 Rev. 21, page 3 section 4.0
2. KA Numbers 295006G010 (4.1/4.2)

295006G010 ..(KA's)

ANSWER: 20 (2.00)

1. DC Seal Oil Pump [+0.5]
2. Turbine DC Lube Oil Pump [+0.5]
3. Both [+0.5] RFPT DC Lube Oil Pumps [+0.5]

REFERENCE:

1. ONEP-05-1-02-I-4.
2. KA Numbers 295003K206 (3.4/3.5), 295003G010 (3.9/4.1).

295003K206 295003G010 ..(KA's)

ANSWER: 21 (1.00)

a. sufficient time for decay of the short lived fission products. [+0.5]

b. Sufficient water depth to remove 99% of iodine. [+0.5]

REFERENCE:

1. T.S. 3.9.4, 3.9.8 and Basis.
2. KA Numbers 295023G004 (2.7/3.8).

295023K103 295023K101 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER: 22 (1.00)

a. Fast Turbine Control Valve (CV) Closure (Load Reject) (initiates a reactor scram trip) [+0.5]

b. Reactor low water level scram (loss of condensate pumps) [+0.5]

REFERENCE:

1. OP-LG-DT-LP-008-02 L.O. #2.a.
2. KA Numbers 295003K305 (3.7/3.7).

295003K305 ..(KA's)

ANSWER: 23 (3.00)

a. RPV pressure [+0.5], DW temperature [+0.25] and Containment temperature [+0.25]

b. Suppression pool temperature [+0.5] and RPV pressure [+0.5]

c. Suppression pool level [+0.5] and RPV pressure [+0.5]

REFERENCE:

1. EP-2.
2. KA Numbers 295026K301 (3.8/4.1), 295027K301 (3.7/3.8), 295025A203 (3.9/4.1), 295025A204 (3.9/3.9).

295025A203 295025A204 295027K301 295026K301 ..(KA's)

(***** END OF CATEGORY 5 *****)

ANSWER: 01 (1.00)

b. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-F11 Rev. 4. Table 10.
2. KA Numbers 234000A302 (3.1/3.7).

234000A302 ..(KA's)

ANSWER: 02 (1.00)

b. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-B21 pg. 22 section C GE SIL NO. 470.
2. KA Numbers 216000A207 (3.4/3.5).

216000A207 ..(KA's)

ANSWER: 03 (1.00)

d. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-C41-07 pg. 17.
2. KA Numbers 211000K408 (4.2/4.2).

211000K408 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER: 04 (1.00)

d. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-pg. 81, L.O. #4a.
2. KA Numbers 264000K402(4.0/4.2)

264000K402 ..(KA's)

ANSWER: 05 (1.00)

c. [+1.0]

REFERENCE:

1. OP-Z51-501, Rev. 1 pg. 12.
2. KA Numbers 290003K401 (3.1/3.2)

290003K401 ..(KA's)

ANSWER: 06 (1.00)

a. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-C51-3 pg. 16, section IV.B.9.
2. KA Numbers 215005G012 (3.7/3.6).

215005G012 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER: 07 (1.00)

a. [+1.0]

REFERENCE:

1. OP-LO-SYS-LP-T48 pg.17 section VI.G.
2. KA Numbers 288000A301 (3.8/3.8)

288000A301 ..(KA's)

ANSWER: 08 (1.00)

c. [+1.0]

REFERENCE:

1. TS 4.1.5. and Table 3.1, 5-1.
2. KA Numbers 211000G006 (3.1/4.2).

211000G006 ..(KA's)

ANSWER: 09 (2.00)

a. 6 [+0.5]

b. 5 [+0.5]

c. 1 [+0.5]

d. 7 [+0.5]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. OP-LO-SYS-LP-E22-02 L.O. #5.
2. OP-LO-SYS-LP-E12-05 L.O. #5.
3. OP-LO-SYS-LP-P64-04 Table 4, L.O. #3.
4. KA Numbers 205000K402 (3.7/3.8), 286000K402 (3.3/3.5), 218000K501 (3.8/3.8), 203000K401 (4.2/4.2).

286000K402 218000K501 203000K401 205000K402 ..(KA's)

ANSWER: 10 (2.00)

a. 3 [+0.5]

b. 4 [+0.5]

c. 3 [+0.5]

d. 3 [+0.5]

REFERENCE:

1. OP-LO-SYS-LP-E12-05 L.O. #5.C.
2. KA Numbers 205000K401 (3.4/3.4), 205000K402 (3.7/3.8), 205000K403 (3.8/3.8).

205000K401 205000K402 205000K403 ..(KA's)

ANSWER: 11 (1.50)

a. 6 [+0.5 each]

b. 5 [+0.5 each]

c. 2 [+0.5 each]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. GGNS OP-LO-SYS-LP-C34-02, Section VI.
2. KA Numbers 259002K410 (3.4/3.4), 259002K409 (3.1/3.1), 259002K404 (2.9/2.9).

259002K404 259002K409 259002K410 ..(KA's)

ANSWER: 12 ~~(2.00)~~ 1.5

a. 1 [+0.5] Deleted

b. 4 [+0.5]

c. 3 [+0.5]

d. 3 [+0.5]

REFERENCE:

1. OP-LO-SYS-LP-C11-2, Rev. 1, Section IV.
2. KA Numbers 201005K403 (3.5/3.5), 201005K404 (3.5/3.5).

201005K403 201005K404 ..(KA's)

ANSWER: 13 (2.00)

a. 5 [+0.5]

b. 4 [+0.5]

c. 6 [+0.5]

d. 7 [+0.5]
or 6 Based on question to proctor

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. OP-B33-2-501-2 pg. 16M, Table 2, Figure 1 & 2.
2. KA Numbers 202002K408 (3.3/3.4), 202002K409 (3.3/3.4), 202002A108 (3.4/3.4).

202002K409 202002A108 202002K408 ..(KA's)

ANSWER: 14 (2.00)

a. 2 [+0.5]

b. 5 [+0.5]

c. 2 [+0.5]

d. 6 [+0.5]

REFERENCE:

1. OP-LO-SYS-LP-E22-1 L.O. #7.
2. KA Numbers 209002K201 (3.2/3.3), 209002K202 (2.8/2.9), 209002K203 (2.8/2.9).

209002K202 209002K203 209002K201 ..(KA's)

ANSWER: 15 (2.50)

a. 3 [+0.25]

b. 6 [+0.25]

c. 8 [+0.25] + [0.5]

d. 5 [+0.25]

e. 1 [+0.25]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. EP-3 Step L-16, L-17, L-20.
2. OP-LO-SYS-LP-G33/36, L.O. #5a.
3. 03-1-01-1 Rev. 37 pg. 29, TS 3.10.5.
4. OP-LO-SYS-LP-M71, L.O. #4 pp. 16-19.
5. KA Numbers 217000K103 (3.6/3.6), 204000K403 (2.9/2.9), 209002K102 (3.5/3.5), 223002K101 (3.8/3.9).

217000K103 204000K403 209002K102 223002K101 ..(KA's)

ANSWER: 16 (2.00)

a. 1. [+0.5]

b. 5. [+0.5]

c. 2. [+0.5]

d. 4. [+0.5]

REFERENCE:

1. GGNS OP-C11-23, L.O. #6.a and b.b.
2. KA Numbers 201005K103 (3.7/3.7), 201005K104 (3.7/3.7).

201005K103 201005K104 ..(KA's)

ANSWER: 17 (2.00)

a. 2 [+0.5]

b. 4 [+0.5]

c. 1 [+0.5]

d. 3 [+0.5]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. OP-LO-SYS-D17, Table 5; L.O. 5.a.2&3.
2. ONEP 05-1-02-II-3 Immediate OP. ACT.
3. KA Numbers 272000K106 (3.2/3.3), 272000K110 (3.4/3.6), 272000K120 (2.8/3.0), 272000K402 (3.7/4.1).

272000K106 272000K110 272000K120 272000K402 ..(KA's)

ANSWER: 18 (2.00)

1. IN64-FV-F060, Off Gas Discharge To Vent.
2. F054, Prefilter Inlet Drain.
3. F034 (A)B, Condenser Drain.
4. F023, Holdup, Line Drain.

Name or number

[+0.5] each, valve name or number.

REFERENCE:

1. ONEP 05-1-02-II-2 Immediate Operator Action.
2. KA Numbers 271000K408 (3.1/3.3), 271000A204 (3.7/4.1).

271000K408 271000A204 ..(KA's)

ANSWER: 19 (2.00)

1. SSW System [+0.5] (loops A and B return line).
2. CCW System [+0.5] (return line).
3. Radwaste [+0.5] (effluent to discharge basin).
4. Alternate Decay Heat Removal System [+0.5]

ADHR/PSW

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. OP-LO-SYS-D17 pg. 34.
2. KA Numbers 272000K104 (2.9/2.9), 272000K105 (2.8/3.1).

272000K104 272000K105 ..(KA's)

ANSWER: 20 (1.00)

HCU accumulator [+0.5]
reactor pressure [+0.5]

REFERENCE:

1. OP-C11-1B-501-2 pg. 35, C1 and C4.
2. KA Numbers 201003K404 (3.6/3.7).

201003K404 ..(KA's)

ANSWER: 21 (1.00)

c. [+1.0]

REFERENCE:

1. AP-01-S-08-15, Rev 2.
2. KA Numbers 294001K110 (3.1/3.4).

294001K110 ..(KA's)

ANSWER: 22 (1.00)

c. [1.0]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. AP-01-5-11-10 Rev 11 pg. 43, Section 6.12.2. d and e.
2. KA Numbers 294001K105 (3.2/3.7).

294001K105 ..(KA's)

ANSWER: 23 (1.00)

d. [+1.0] Deleted

REFERENCE:

1. AP-01-S-12-5 Rev. 3 pp. 5-6 section 6.3.
2. KA Numbers 294001K107 (3.3/3.6).

294001K107 ..(KA's)

ANSWER: 24 (1.00)

c. [+1.0]

REFERENCE:

1. TS, Section 6, Table 6.2.2-1.
2. 02-S-01-7, Rev. 2, page 4, section 6.2.3
3. KA Numbers 294001A111 (3.3/4.3).

294001A111 ..(KA's)

ANSWER: 25 (1.00)

c. [+1.0] Deleted

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. T.S. Table 6.2.2.1
2. KA Numbers 294001A103 (2.7/3.7)

294001A103 ..(KA's)

ANSWER: 26 (1.00)

a. 2 [+0.5]

b. 3 [+0.5]

REFERENCE:

1. OP-LO-MCD-LP-009-02 L.O. #8 and #9.
2. KA Numbers 294001K115 (3.4/3.8).

294001K115 ..(KA's)

ANSWER: 27 (2.50)

a. 7

b. 6

c. 10

d. 5

e. 8

[+0.5 each]

REFERENCE:

1. 01-S-08-2.
2. KA Numbers 294001K103 (3.3/3.8).

294001K103 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER: 28 (2.00)

a. 2. [+0.5]

b. 5. [+0.5]

c. 1. [+0.5]

d. 4. [+0.5]

REFERENCE:

1. UP-DT-553 L.O # C.2, D.2, E.2, F.1.
2. 10-S-01-1 Attachment.
3. KA Numbers 294001A116 (2.9/4.7).

294001A116 ..(KA's)

ANSWER: 29 (3.00)

a. 1.

b. 4.

c. 2.

d. 2.

e. 3.

f. 1.

[+0.5 each]

REFERENCE:

1. UP-DT-553 L.O. #C.2, D.2, E.2, F.1.
2. 10-S-01-1 Attachment.
3. KA Numbers 294001A116 (2.9/4.7).

294001A116 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER: 30 (1.25)

a. 100 [+0.25]

b. 1,000 [+0.25]

c. (1) 1,000 [+0.25]
(2) 20 [+0.25]

d. 50,000 [+0.25]

REFERENCE:

1. AP 01-S-08-2 Rev. 20.
2. KA Numbers 294001K104 (3.3/3.6), 294001K105 (3.2/3.7).

294001K104 294001K105 ..(KA's)

ANSWER: 31 (1.25)

(a) 8 [+0.25]

(b) 72 [+0.25]

(c) 24 [+0.25]

(d) 16 [+0.25]

(e) 16 [+0.25]

REFERENCE:

1. Administrative Procedure 01-5-06-2
2. OP-LO-AD-LP-001-05, LO #23
3. KA Numbers 294001A103 (2.7/3.7)

294001A103 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER: 32 (1.00)

a. departure from a license condition [+0.5]

b. a licensed senior operator
(a licensed shift supervisor)
(a licensed shift superintendent)
[+0.5 for any one]

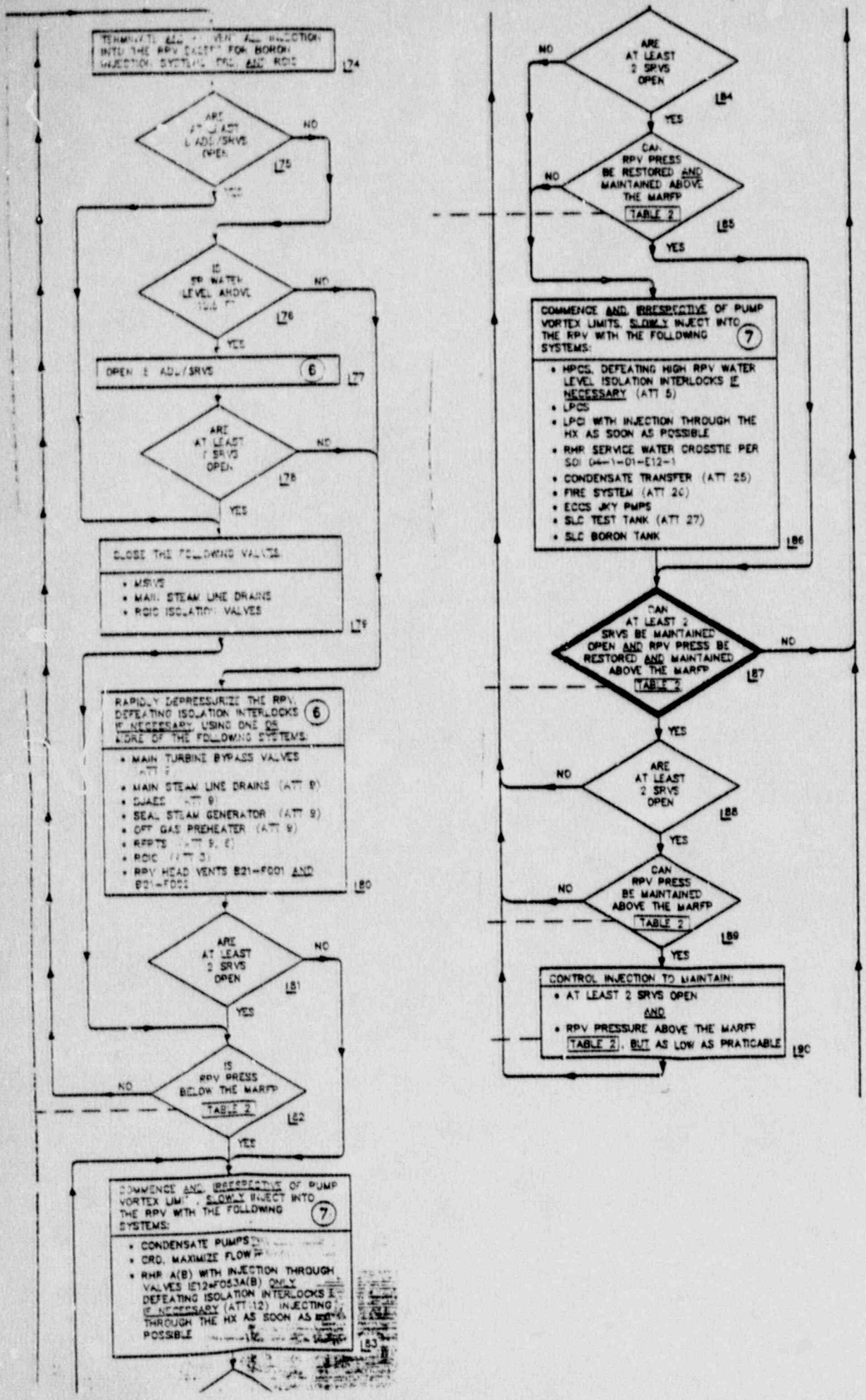
REFERENCE:

1. 10CFR50.54 x and y.
2. AP 01-5-02-1.
3. KA Numbers 294001A111 (3.3/4.3), 294001A112 (3.5/4.2).

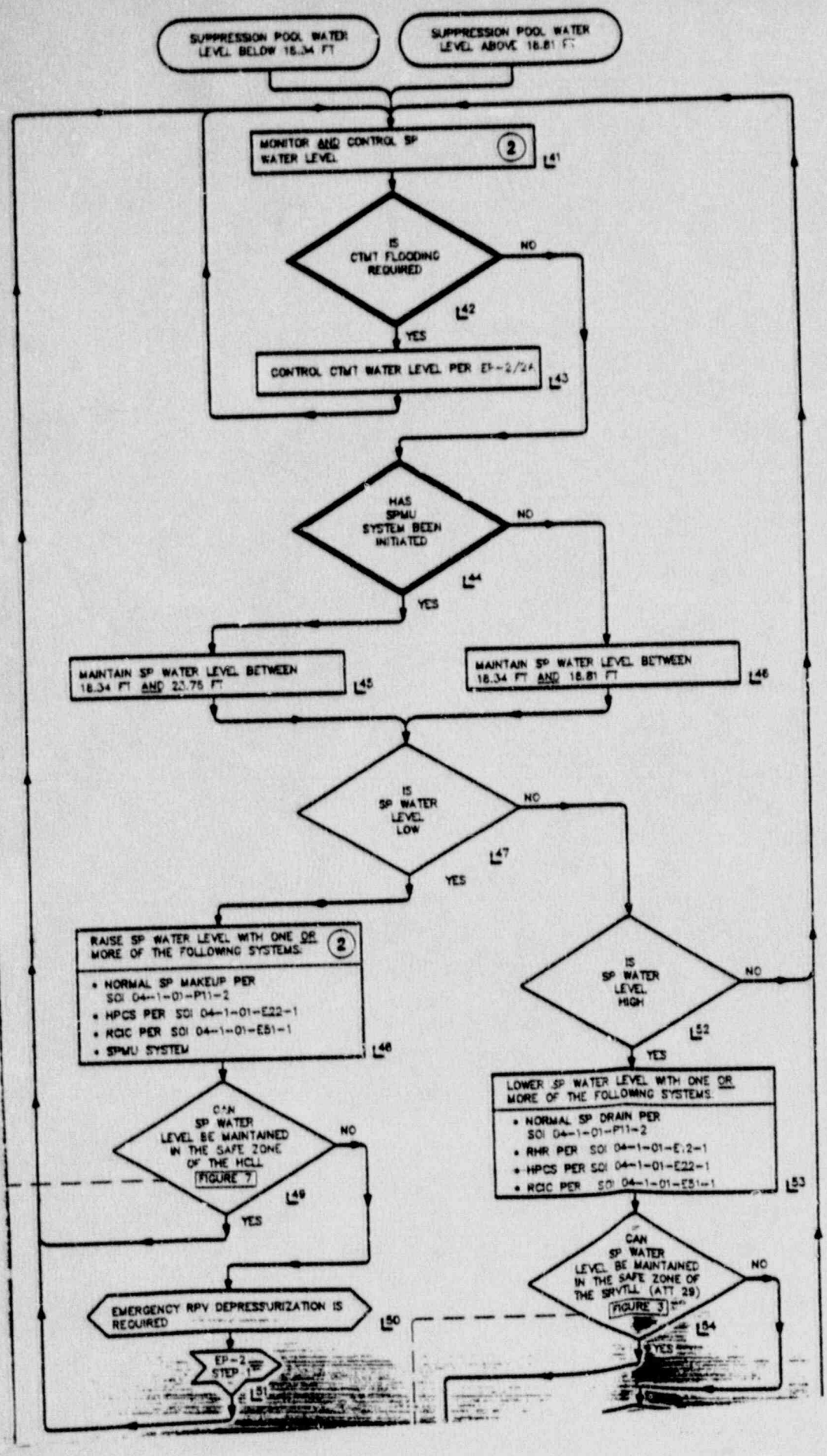
294001A111 294001A112 ..(KA's)

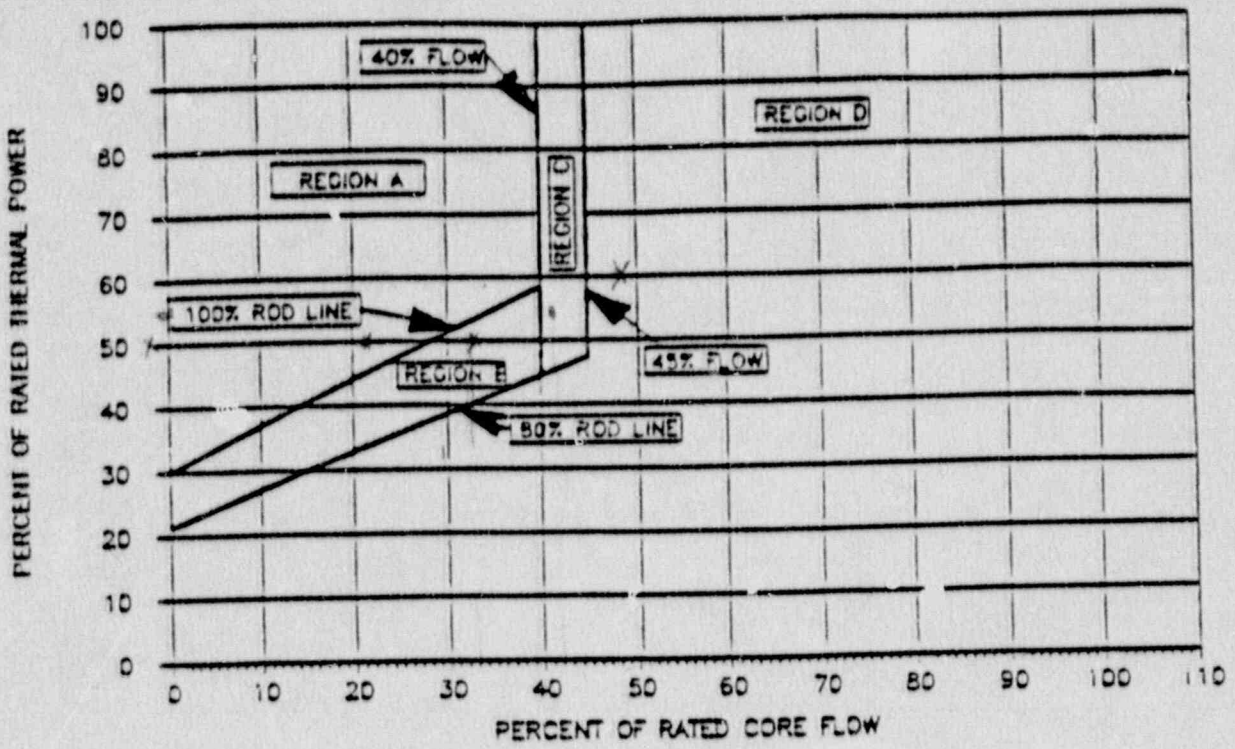
(***** END OF CATEGORY 6 *****)
(********** END OF EXAMINATION **********)

RPV FLOODING



SUPPRESSION POOL WATER LEVEL CONTROL




PERCENT OF RATED THERMAL POWER
100
90
80
70
60
50
40
30
20
10
0
40% FLOW
REGION D
REGION A
REGION C
100% ROD LINE
REGION B
45% FLOW
80% ROD LINE
0
10
20
30
40
50
60
70
80
90
100
110
PERCENT OF RATED CORE FLOW

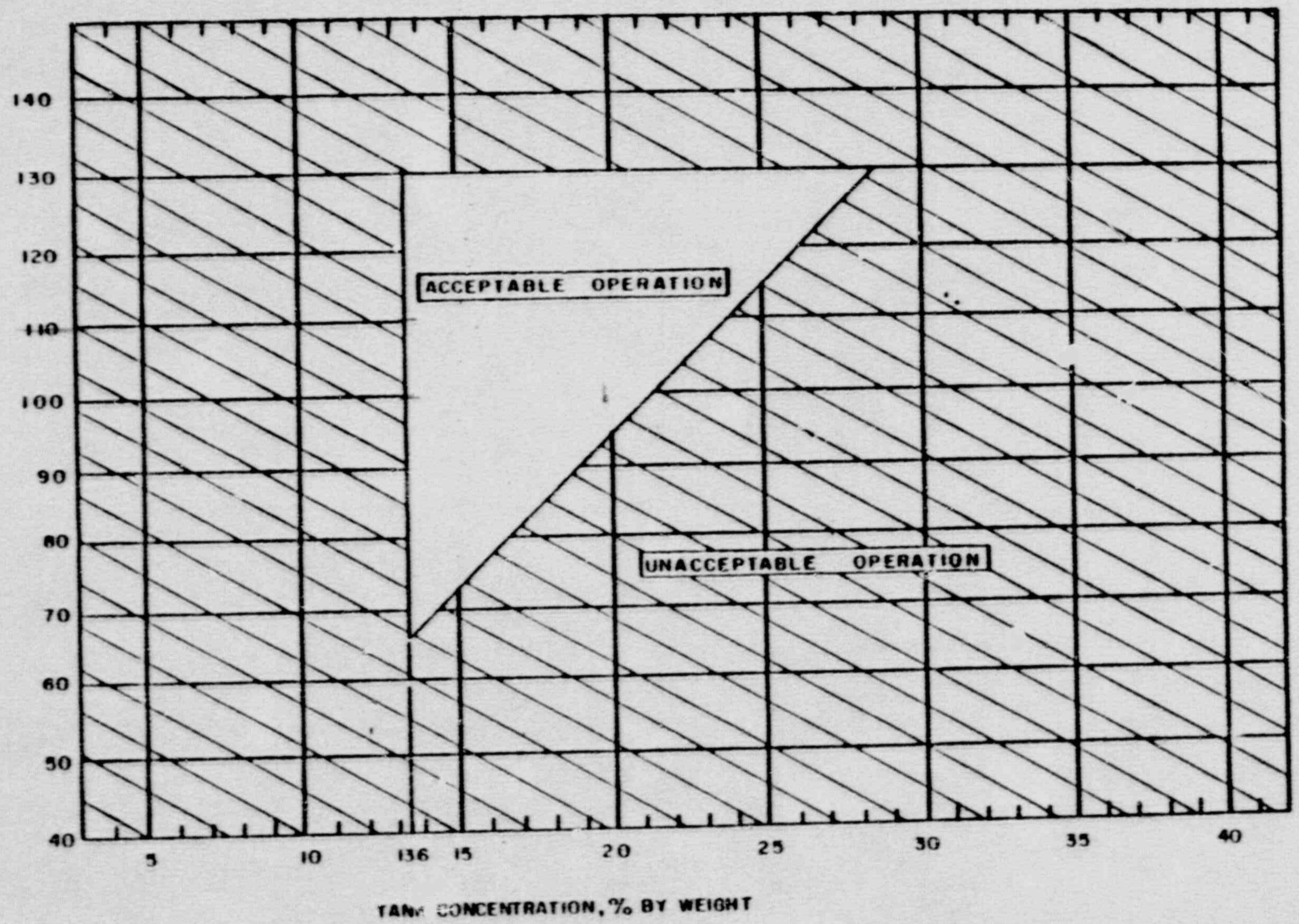


FIGURE 3.1.5-1 SODIUM PENTABORATE SOLUTION TEMPERATURE/CONCENTRATION REQUIREMENTS

EMERGENCY CLASSIFICATIONS
TABLE OF CONTENTS

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
1. Safety System Functions	1. ECCS initiated AND Injected into reactor vessel	1. Automatic initiation of LPCS or LPCI A, B, or C due to: a. Low low low reactor water level (-150.3") OR b. High drywell pressure (1.39 psig) OR 2. Manual initiation of LPCS or LPCI A, B, or C for level control	UNUSUAL EVENT
	2. Failure of a safety/ relief valve to close following reduction of applicable pressure to below reset point	1. A safety relief valve fails to close following a manual scram initiated due to a stuck open relief as required by Technical Specification 3.4.2.1	

ECCS - Emergency Core Cooling System
LPCS - Low Pressure Core Spray
LPCI - Low Pressure Core Injection

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
1. Safety System Functions (Cont.)	3. Loss of primary containment integrity	The commencement of a plant shutdown required by: 1. Primary containment integrity 3.6.1.1 OR 2. Drywell integrity 3.6.2.1 OR 3. Containment structural integrity 3.6.1.6 OR 4. Drywell structural integrity 3.6.2.4 OR 5. Containment air locks 3.6.1.3 OR 6. Drywell air locks 3.6.2.3 OR 7. Suppression pool operability 3.6.3.1 OR 8. Containment and drywell isolation valves 3.6.4	UNUSUAL EVENT

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
1 Safety System Functions (Cont.)	4. Loss of secondary containment integrity	The commencement of a plant shutdown required by: 1. Secondary containment integrity 3.6.6.1 OR 2. Secondary containment automatic isolation dampers/valves 3.6.6.2 OR 3. Standby Gas Treatment Subsystem 3.6.6.3	UNUSUAL EVENT
	5. Loss of ESF function	The commencement of a plant shutdown required by: 1. Safety/relief valves 3.4.2.1 OR 2. Safety/relief valves low low set function 3.4.2.2 OR 3. ECCS - Operating 3.5.1 OR 4. Containment spray 3.6.3.2 OR 5. Suppression Pool Makeup System 3.6.3.4	

ESF - Engineered Safety Feature

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
2. Abnormal Primary Leak Rate	1. Exceeding primary coolant system leak rate	1. > 0 pressure boundary leakage OR 2. > 30 gpm total leakage	UNUSUAL EVENT
	2. Coolant leak rate > 50 gpm	1. Total leakage calculated to be > 50 gpm while in Plant Operational Condition 1, 2 or 3	ALERT
	3. LOCA > makeup pump capacity	1. Reactor vessel water level at or below the top of active fuel as indicated on fuel zone level indicator (-167" fuel zone) AND 2. Makeup capacity unable to increase reactor vessel level	SITE AREA EMERGENCY
3. Abnormal Coolant Temperature/ Pressure/ Safety Limit	1. Abnormal reactor coolant pressure and/or temperature OR Abnormal fuel temperatures	1. Reactor vessel steam dome pressure > 1325 psig OR 2. Reactor/thermal power > 25% rated (958 MWt) AND < 785 psig dome pressure OR < 10% core flow OR 3. MCPR < 1.06 (Single Recirc Loop Ops - MCPR < 1.07) AND > 785 psig dome pressure and > 10% core flow OR 4. Temperature to the left of the applicable curve on Tech Spec Figure 3.4.6.1-1	UNUSUAL EVENT

LOCA - Loss of Coolant Accident
MCPR - Minimum Critical Power Ratio
MWt - Megawatt Thermal

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
4 Core Fuel Damage	1. Fuel damage indication	Verification of: 1. Increase of 100,000 µCi/sec in 30 minutes in offgas release rate OR 2. > 500,000 µCi/sec offgas release rate OR 3. Laboratory analysis of coolant sample indicates > 0.2 µCi/ml dose equivalent I-131 for more than 48 hours OR 4. Laboratory analysis of coolant sample indicates > 4.0 µCi/ml dose equivalent I-131	UNUSUAL EVENT
	2. Severe loss of fuel cladding	Verification of: 1. Offgas pretreatment monitor reading > 5 Ci/sec OR 2. Coolant sample analysis indicates 300 µCi/ml dose equivalent I-131 OR 3. Main steam line radiation exceeds radiation monitor trip setpoint	ALERT

µCi - Micro Curies

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
4. Core Fuel Damage (Cont.)	3. Degraded core with possible loss of coolant	1. Reactor water level at or below top of active fuel core height as indicated on fuel zone level indicator (-167" fuel zone) AND 2. a. High coolant activity indicated by analysis of sample > 300 µCi/ml dose equivalent I-131 OR b. Radiation monitoring team reports indicate (at the site boundary) ≥ 50 mR/Hr (30 minutes) OR ≥ 500 mR/Hr (2 minutes) OR ≥ 3.75 E-7 µCi/cc Iodine	SITE AREA EMERGENCY

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
4. Core Fuel Damage (Cont.)	4. Loss of 2 of 3 fission product barriers with a potential loss of 3rd barrier	1. Radiation monitoring team reports indicate (at the site boundary): a. > 50 mR/Hr Whole Body OR b. > 3.75 E-7 µCi/cc Iodine AND 2. Containment pressure exceeds 17.25 psig or containment is breached	GENERAL EMERGENCY
5. Steam Leaks	1. Main steam line break outside the containment with significant MSIV leakage.	1. Isolation initiated and abnormal leakage down stream of MSIVs (> 10 gpm or 5000 lbm/hr)	ALERT
	2. RCIC steam line break outside the containment with significant isolation valve leakage	1. Isolation initiated and abnormal leakage down stream of isolation valves (> 10 gpm or 5000 lbm/hr)	
	3. Main steam line break outside of containment which cannot be isolated.	1. Isolation required due to confirmed steam line break AND One or more main steam lines fails to isolate	SITE AREA EMERGENCY
	4. RCIC steam line break outside of containment which cannot be isolated.	1. Isolation required due to confirmed steam line break AND RCIC steam line fails to isolate	

MSIV - Main Steam Isolation Valve
RCIC - Reactor Core Isolation Cooling

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
6. Abnormal Effluent, GASEOUS	1. Radiological effluent release rate exceeds Tech Spec limit	1. Entering the action statement of the following LCOs in the Radioactive Gaseous Effluent section of Tech Specs 3.11.2.1, 3.11.2.2, and 3.11.2.3	UNUSUAL EVENT
	2. Radiological effluent > 10 times Tech Spec limit	1. High high radiation alarms on ONE OR MORE monitors: a. Radwaste Bldg vent exhaust b. Fuel handling vent exhaust c. Containment vent exhaust d. Turbine Bldg vent exhaust AND 2. Summation of monitors (including SGTS A and B) exceeds 10 times Tech Spec limit (3.11.2.1)	ALERT

LCO - Limited Condition for Operation
SGTS - Standby Gas Treatment System

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
6. Abnormal Effluent, GASEOUS (Cont.)	3. Effluent monitors detect levels corresponding to site boundary exposure of: a. ≥ 50 mR/Hr (for 30 minutes) Whole Body OR b. ≥ 500 mR/Hr (for 2 minutes) Whole Body OR c. 500 mRem Thyroid Dose Commitment NOTE "Adverse Meteorology" -Stability Class F, wind speed 1 m/sec, site boundary X/Q 1080 E-6 sec/m^3 (FSAR Table 15.6-12)	1. Containment post-accident radiation monitor reads > 10,000 mR/hr OR 2. Any post accident effluent radiation monitor confirm release rates corresponding to: a. 0.09 Ci/sec Noble Gas (30 minutes) OR b. 3.5 E-4 Ci/sec Iodine (30 minutes) OR c. 0.9 Ci/sec Noble Gas (2 minutes) OR d. 3.5 E-3 Ci/sec Iodine (2 minutes) OR 3. Radiation monitoring teams report radiation and/or Iodine concentration readings at the site boundary corresponding to: a. 50 mR/Hr (for 30 minutes) OR b. 500 mR/Hr (for 2 minutes) OR c. 3.75 E-7 µCi/cc Iodine	SITE AREA EMERGENCY

FSAR - Final Safety Analysis Report

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
6. Abnormal Effluent, GASEOUS (Cont.)	4. Effluent monitor(s) (UNDER ACTUAL METEOROLOGICAL CONDITIONS) detect levels corresponding to site boundary exposure of: 1000 mRem Dose Commitment Whole Body OR 5000 mRem Dose Commitment Thyroid	1. Effluent monitor(s) (UNDER ACTUAL METEOROLOGICAL CONDITIONS) confirms release rates corresponding to site boundary exposure of: a. 500 mR/Hr Whole Body (30 minutes) OR b. 5000 mRem Thyroid Dose Commitment (2 hours) OR 2. Radiation monitoring teams report radiation and/or iodine concentrations readings (at the site boundary) corresponding to: a. 500 mR/Hr Whole Body (for 30 minutes) OR b. 3.75 E-6 µCi/cc Iodine	GENERAL EMERGENCY
7. Abnormal Effluent, LIQUID	1. Radiological Effluent Release Rate exceeds Tech Spec limit	1. Entering the action statement of LCO 3.11.1.1, in the Radioactive Liquid Effluent section of Tech Spec	UNUSUAL EVENT
	2. Radiological Effluent > 10 times Tech Spec limit	1. Liquid release > 10 times the limit of LCO 3.11.1.1 in the Radioactive Liquid Effluent section of Tech Spec	ALERT

LCO - Limited Condition for Operation

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
8. Major Electrical Failures (AC)	1. Total loss of offsite power OR Loss of onsite AC power capability	1. Loss of offsite power to: a. 15AA AND b. 16AB AND c. 17AC OR 2. Loss of ALL three divisional diesel generators while in Plant Operational Condition 1, 2 or 3	UNUSUAL EVENT
	2. Total loss of offsite power AND Loss of ALL onsite power ≤ 15 minutes	1. Loss of offsite power to: a. 15AA AND b. 16AB AND c. 17AC AND 2. Loss of all three divisional diesel generators AND 3. ≤ 15 minutes	ALERT

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
8. Major Electrical Failures (AC) (Cont.)	3. Total loss of offsite power AND Loss of ALL onsite power > 15 minutes	1. Loss of offsite power to: a. 15AA AND b. 16AB AND c. 17AC AND 2. Loss of all three divisional diesel generators AND 3. > 15 minutes	SITE AREA EMERGENCY
9. Major Electrical Failures (DC)	1. Loss of onsite ESF DC power for ≤ 15 minutes	1. Loss of Division 1, 2 and 3 (125 Vdc for ≤ 15 minutes)	ALERT
	2. Loss of onsite ESF DC power for > 15 minutes	1. Loss of Division 1, 2 and 3 (125 Vdc for > 15 minutes)	SITE AREA EMERGENCY

ESF - Engineered Safety Feature

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
10. Control Room Evacuation	1. Evacuation of the Control Room AND Control established at the remote shutdown panel	1. Control Room evacuated AND 2. Control of shutdown systems established at the remote shutdown panel	ALERT
	2. Evacuation of the Control Room AND Control not established at the remote shutdown panel within 15 minutes	1. Control Room evacuated AND 2. Unable to establish control of shutdown systems at the remote shutdown panel within 15 minutes of evacuating the Control Room	SITE AREA EMERGENCY
11. Fire	1. Fire lasting > 10 minutes after discovery	1. A fire within the power block, fire water pump house or CO_2 skid lasting >10 minutes from the time of notification	UNUSUAL EVENT
	2. Fire potentially affects safety systems	1. A fire defeating ONE safety system electrical division	ALERT
	3. Fire compromising the functions of ESF Systems	1. A fire defeating MORE THAN ONE safety system electrical division	SITE AREA EMERGENCY

ESF - Engineered Safety Feature

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
12. Plant Shutdown Function	1. Complete loss of functions needed for plant COLD shutdown.	1. All control rods fully inserted AND 2. The determination that there are no longer enough systems functional to attain or maintain the reactor coolant < 200°F	ALERT
	2. Failure of the Reactor Protection System to initiate and complete a scram which brings the reactor subcritical	1. Scram conditions confirmed with inability to manually scram AND 2. All control rods NOT inserted to between 00 and 06 AND 3.a. Reactor is still CRITICAL with power < 5% on APRM or < 20 on range 8 of inse.ted IRMS OR b. Criticality is predicted	

APRM - Average Power Range Monitor
IRMS - Intermediate Range Monitor System

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
12. Plant Shutdown Function (Cont.)	3. Complete loss of functions needed for plant HOT shutdown	1. Scram conditions confirmed with inability to manually scram AND 2. All control rods NOT fully inserted between 00 and 06 AND 3.a. Reactor is still critical or predicted critical AND 4.a. Failure of both standby liquid control pumps to inject into the vessel OR b. Failure of the SLC system to bring or maintain the reactor subcritical	SITE AREA EMERGENCY

SLC - Standby Liquid Control

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
12. Plant Shutdown Function (Cont.)	4. Transient requiring operation of shutdown systems with failure to scram and continued power generation but NO CORE DAMAGE immediately evident	1. Scram conditions confirmed with inability to manually scram AND 2. All control rods NOT inserted to between 00 and 06 AND 3.a. Reactor power ≥ 5% on APRMs OR b. Reactor power ≥ 20 on range 8 of inserted IRMs AND 4. No core damage immediately evident	SITE AREA EMERGENCY
	5. Reactor shutdown AND Loss of decay heat removal capability AND CORE DAMAGE predicted within several hours AND Subsequent containment failure	1. All rods fully inserted AND 2. No method is available for decay heat removal AND 3. Core damage has occurred or is predicted to occur within two hours as reported by Reactor Engineering AND 4. Containment pressure is >17.25 psig or containment is breached	GENERAL EMERGENCY

APRM - Average Power Range Monitor
IRM - Intermediate Range Monitor

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
12. Plant Shutdown Function (Cont.)	6. Transient requiring operation of shutdown system with failure to scram with continued power generation AND CORE DAMAGE predicted within several hours or less AND Containment failure likely	1. Scram conditions confirmed with inability to manually scram AND 2. All control rods NOT inserted to between 00 and 06 AND 3.a. Reactor power ≥ 5% on APRMs OR b. Reactor power ≥ 20 on range 8 of inserted IRMs AND 4. Core damage is predicted to occur within two hours as reported by Reactor Engineering AND 5. Containment pressure is > 17.25 psig or containment is breached	GENERAL EMERGENCY
13. Abnormal In-plant Radiation/ Airborne Levels	1. Radiation levels or airborne contamination indicate a severe degradation in the control of radioactive materials	1. Verification of area radiation monitor reading > 1000 times set point OR 2. Verification of CAM reading > 1000 times set point	ALERT

CAM - Continuous Air Monitor
APRM - Average Power Range Monitor
IRM - Intermediate Range Monitor

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
14. Fuel Handling Accident	1. Fuel damage accident with release of radioactivity to Containment or Auxiliary Building	1. Notification of a spent fuel damaging accident AND 2. High high radiation alarms on either a. Fuel handling vent exhaust OR b. Containment vent exhaust AND 3. Summation of all releases exceeds 10 times Tech Spec limit (3.11.2.1)	ALERT
	2. Major damage to spent fuel assembly in Containment or Auxiliary Building	1.a. Notification of a spent fuel damaging accident OR b. Low water level in spent fuel pool below top of spent fuel and unable to restore level to above fuel. AND (Continued)	SITE AREA EMERGENCY

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
14. Fuel Handling Accident (Cont.)		2.a. Any post accident effluent radiation monitor confirm Noble Gas, Iodine release rates corresponding to: b. 0.09 Ci/sec Noble Gas (30 minutes) OR c. 3.5 E-4 Ci/sec Iodine (30 minutes) OR d. 0.9 Ci/sec Noble Gas (2 minutes) OR e. 3.5 E-3 Ci/sec Iodine (2 minutes) OR 3. Radiation monitoring teams report Radiation and/or Iodine concentration readings at the site boundary corresponding to: a. 50 mR/Hr (for 30 minutes) OR b. 500 mR/Hr (for 2 minutes) OR c. 3.75 E-7 µCi/cc Iodine	SITE AREA EMERGENCY
15. Contaminated Injured Personnel	1. Transportation of contaminated injured individual from site to hospital	1. Notification that a contaminated individual is being transported from the site to a hospital	UNUSUAL EVENT

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
16. Security Threat	1. Security threat OR Attempted entry OR Attempted sabotage	1. Based upon the assessment of the alarm or the event reported by Security. Actual threat must be determined prior to establishing an emergency classification	UNUSUAL EVENT
	2. On-going Security compromise	1. Identification of adversaries attempting to command areas of plant, but not controlling shutdown capability OR vital areas	ALERT
	3. Imminent loss of physical control of plant	1. Physical attack on the plant involving imminent occupancy of the Control Room or Remote Shutdown Panel.	SITE AREA EMERGENCY
	4. Loss of physical control of the facility	1. Physical attack on the plant has resulted in unauthorized personnel occupying the Control Room or Remote Shutdown Panel	GENERAL EMERGENCY

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
17. Hazards to Plant Operations	1. Hazards being experienced or projected with the potential for degradation of the level of safety of the plant	1. Notification of an aircraft crash onsite (no plant structure or equipment damage) OR 2. Notification of unusual aircraft activity over the facility OR 3. Notification of an onsite explosion (does not affect plant operation) OR 4. Determination that a release of toxic, oxygen displacing, or flammable gas will significantly hamper the ability of personnel to perform activities affecting plant safety OR 5. A manual or automatic scram initiated because of a turbine blade failure that has not penetrated the casing	UNUSUAL EVENT

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
17. Hazards to Plant Operations (Cont.)	2. Hazards being experienced or projected with actual or potential substantial degradation of the level of safety of the plant	1. Notification of an aircraft crash into plant non-vital structures (Turbine Bldg, Warehouse, Admin Bldg, etc.) OR 2. Notification of missile impacts on plant non-vital structures OR 3. Notification of an onsite explosion affecting plant operation OR 4. Determination that the entry of toxic or flammable gases into facility structures has threatened to render Safety Related equipment Inoperable OR 5. Notification of a turbine failure that has resulted in casing penetration	ALERT

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
17. Hazards to Plant Operations (Cont.)	3. Hazards being experienced or projected with the plant not in COLD shutdown or refuel which involve actual or likely major failures of plant functions needed for protection of the public	1. Notification of an aircraft crash into plant vital structures (SSW complex, Diesel Generator, Auxiliary, Containment or Control Buildings) OR 2. Notification of severe damage to safe shutdown equipment from missiles or explosion OR 3. Determination that the entry of toxic or flammable gases into vital areas (Control Room, ESF SWGR, Remote Shutdown Rooms, etc.) constitutes a plant safety problem	SITE AREA EMERGENCY

SSW - Standby Service Water
ESF - Engineered Safety Feature
SWGR - Switchgear

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
18. Natural Events	1. Natural events being experienced or projected beyond usual levels	1. A verified earthquake detected by in-plant seismic instrumentation OR 2. A tornado observed onsite OR 3. A hurricane warning issued that includes the site area	UNUSUAL EVENT
	2. Severe natural event near site being experienced or projected	1. A verified earthquake detected by in-plant seismic instrumentation ≥ OBE levels OR 2. A tornado causing damage to Safety Related structures OR 3. Sustained winds ≥ 73 mph onsite	ALERT
	3. Severe natural event near site being experienced or projected with plant in Modes 1, 2, or 3	1. A verified earthquake detected by in-plant seismic instrumentation ≥ SSE levels OR 2. Sustained winds ≥ 90 mph onsite	SITE AREA EMERGENCY
	4. Major internal OR external events	1. Fires, earthquakes, etc., substantially beyond design basis which could or have caused massive common damage to plant systems	GENERAL EMERGENCY

OBE - Operating Earthquake
SSE - Safe Shutdown Earthquake

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
19. Other	1. Significant loss of vital accident assessment or communications capability	1. Total loss of vital accident assessment equipment such as: a. All meterological equipment b. All vessel level instruments c. All containment monitoring instruments, etc. OR 2. Degradation of the offsite communication system to only one source	UNUSUAL EVENT
	2. Other plant conditions exist that warrant increased awareness on the part of the plant operating staff AND/OR State and Local Authorities	1. Exceeding any safety limit as required by Tech Specs	
	3. Loss of ALL annunciators (stable conditions)	1. Loss of ALL annunciators in the controlled area AND 2. Plant is in a stable condition (no significant transient in progress or initiated)	ALERT
	4. Other plant conditions warrant activation of TSC	1. Emergency Director determines that plant conditions exist that warrant precautionary activation of the TSC and placing the EOF and key plant personnel on standby	

TSC - Technical Support Center EOF - Emergency Operations Facility

EMERGENCY CLASSIFICATIONS

CATEGORY	INITIATING CONDITION	EMERGENCY ACTION LEVEL	EMERGENCY CLASSIFICATION
19. Other (Cont.)	5. Loss of ALL annunciators (conditions not stable)	1. Loss of all annunciators in the controlled area AND 2. The plant is NOT in a stable condition (a significant transient initiated or in progress)	SITE AREA EMERGENCY
	6. Other plant conditions exist that warrant activation of Emergency Facilities	1. Emergency Director determines that plant conditions exist that warrant: a. The activation of the EOF and SAP OR b. A precautionary notification to the public near the site	
	7. Other plant conditions exist that make release of large amounts of radio-activity in a short time possible	1. Reactor vessel water level at or below the top of active fuel AND 2. Containment pressure is > 17.25 psig or containment is breached AND 3. Core damage is predicted to occur (within 2 hours) as reported by Reactor Engineering	GENERAL EMERGENCY

EOF - Emergency Facility
SAP - Site Access Point

RO EXAMINATION COMMENTS

Category 2

Question 9

See SRO Category 5 Question 7

Question 15

See SRO Category 5 Question 13

Category 3

Question 4

See SRO Category 6 Question 2

Question 6

See SRO Category 6 Question 3

Question 9

WHICH ONE (1) of the following abnormal CRD operating conditions may cause CRD seal damage?

a. Closing the HCU isolation valves with the reactor at operating pressure and temperature.

b. Insufficient charging water header pressure and temperature.

c. Insufficient scram accumulator nitrogen charging pressure.

d. Scramming a rod located between positions 08 and 02 with the reactor at low pressure.

Answer: d [1.0]

Reference: OP-LO-SYS-LP-C11-1A PG 20

Comment:

Selection "A" should, also, be considered a correct answer. If the HCU is isolated a rated reactor conditions, a loss of

cooling water would occur which would result in over heating of the CRD seal resulting in damage to the seal.

Question 15

See SRO Category 6 Question 10

Question 17

See SRO Category 6 Question 12

Question 18

See SRO Category 6 Question 13

Question 25

See SRO Category 6 Question 18

Question 26

See SRO Category 6 Question 19

Question 30

See SRO Category 6 Question 23

Question 33

See SRO Category 6 Question 25

SRO EXAMINATION COMMENTS

Category 5

Question 7

At 90% power the following conditions are observed:

- Main turbine control valves closing.
- Bypass valves do not open.
- Pressure Controller Failure Annunciator.
- Reactor power and pressure increasing.
- Changeover lights illuminate on BCVs.
- Decreasing main generator output.
- Pressure controller fault light on Panel H13-P680.
- Bypass Aux channel fault illuminate.
- Scram has not occurred.

WHICH ONE (1) of the following failures exist?

a. Pressure signal is lost to one of the IPC channels.

b. EHC fluid pressure indicates zero psig.

c. Failure of either of the EHC valve lift controllers.

d. Electrical fault in the bypass valve opening jack.

Answer: c [1.0]

Reference: ONEP 05-1-02-V-4, Rev 14, page 1

Comment:

Most of the conditions given in the question are taken from the symptoms listed in the referenced ONEP. The symptoms listed in ONEP 05-1-02-V-4 are not the result of any one (1) single failure, and no one (1) single failure will result in all the symptoms listed. For example:

> "Bypass valves do not open" is a condition given in the question. This indicates that there is a fault that would prevent bypass valve operation since "main turbine control valves closing" and "reactor power and pressure increasing" are given. The correct selection out of the four (4) choices given would be "B" as a loss of EHC fluid pressure is the only answer provided that would result in the bypass valves not functioning. But based

on the condition given of "Scram has not occurred", this can not be true because a loss of EHC fluid pressure would result in a scram.

"Failure of either EHC valve lift controllers", listed as the correct answer, is not correct because they have no effect on bypass valve operation. The bypass valves have their own lift controllers which are separate from the main turbine control valve lift controllers. The answer as worded did not specifically state which lift controllers had failed. If it was intended to be main control valve lift controllers, then the bypass valves should have functioned on rising reactor pressure. If it was intended to be the bypass valve lift controllers, then the main turbine control valves should have functioned normally.

Based on the above, we recommend that this question be deleted from the examination.

Question 13

While operating at full power, the plant experiences a total loss of Instrument Air.

MATCH the failure mode in Column B with the components in Column A. Items in Column B may be used more than once or not at all.

Column A	Column B
a. CRD Flow Control Valves	1. Fails as is
b. Main Steam Isolation Valves (MSIV)	2. Fails open
c. Feedwater startup flow control valve	3. Fails closed
d. Main Steam Line drain valves	4. Not affected

Answer: a. 1, b. 3, c. 3, d. 3

Reference: ONEP 05-1-02-V-9

SRO EXAMINATION COMMENTS

Comment:

Part "D" of the question requests the candidate to identify the failure mode of "Main Steam line drain valves". The specific valves being referenced were not given. Since some MSL drain valves are air operated and many are motor operated, the answer to this part could vary. If air operated valves are considered then answer 3 (fails closed) is correct, but if the motor operated valves are considered, then answer 4 (not affected) is correct.

Since the specific valves were not given, it is recommended that either answer 3 or 4 be accepted as correct or delete part "D" from the question.

Question 18

A PARTIAL loss of Component Cooling Water has occurred. You are monitoring the Reactor Recirculation System.

STATE the immediate operator action per ONEP 05-1-02-V-1, Loss of Component Cooling Water, for EACH of the following operating conditions.

a. The Reactor Recirculation pump and motor temperatures both show an increase of 4 degrees F.

b. The high temperature alarm comes in for the Reactor Recalculation pump.

Answer:

a. Close flow control valve to minimum [0.5]

b. Shift to LFMG [0.5]

Reference: ONEP 05-1-02-V-1, pg 3, section 4.2.4.a.

Comment:

Part "B" of the question states "The high temperature alarm comes in for the Reactor Recirculation pump". This is stated as a symptom of a total loss of CCW in ONEP 05-1-02-IV-1, and therefore, could be construed as a total loss situation. If so, this would result in an answer different from the one in the answer key.

If the candidate maintained the assumption of a partial loss

of CCW, then the answer in the key is correct. If the candidate made the assumption of a total loss of CCW, based on the conditions given in part "B" of the question, then the answer would be trip the recirculation pump within one minute.

Based on the above, it is requested that either answer be accepted as correct for part "B" of the question.

Category 6

Question 2

A reactor scram has occurred following a recirculation loop suction line LOCA. The STA has determined that you are in the unsafe region of the RPVST curve of EP-2, RPV Control.

WHICH ONE (1) of the following statement correctly describes the relationship between indicated and actual reactor vessel level? Assume vessel level is above TAF.

a. Actual reactor vessel water level LESS than indicated due to variable leg flashing.

b. Actual reactor vessel water level LESS than indicated due to reference leg flashing.

c. Actual reactor vessel water level GREATER than indicated due to reference leg flashing.

d. Actual reactor vessel water level GREATER than indicated due to variable leg flashing.

Answer: b. [1.0]

Reference: OP-LO-SYS-LP-B21 pg. 22 section C GE SIL NO. 470

Comment:

The question is a valid question, but the type of information being tested by this question is better suited to the Generic Fundamentals Examination.

Question 3

WHICH ONE (1) of the following interlocks will PREVENT a

Standby Liquid Control Pump from starting when initiated from the Control Room?

a. Failure of the electrically activated Explosive (SQUIB) Valve to detonate.

b. Incomplete isolation of the Reactor Water Cleanup (RWCU) system.

c. Complete loss of instrument air to SLC.

d. Suction valve from SLC storage tank closed.

Answer: d. [1.0]

Reference: OP-LO-SYS-LP-C41-07 pg 17

Comment:

The question, as worded, could be confusing. The pump suction valve from the SLC storage tank is normally closed and opens upon receiving an initiation signal. Part "D" of the possible answers needs to be reworded to indicate that the suction valve fails to open upon receiving an initiation signal. This would prevent the pump from starting after receiving an initiation signal. Also, a statement should be added that the system is in its normal standby lineup to prevent the candidate from possibly assuming that the test tank outlet valve is open. If this valve is open, the pump would start following an initiation signal.

Question 8

WHICH ONE (1) analysis of the boron bearing solution meets Technical Specifications for the Standby Liquid Control system subsystem? Technical Specifications provided.

a.	Boron concentration (wt%)	13%
	Volume	4630 gallons
	Temperature	110 deg F
b.	Boron concentration (wt%)	16%
	Volume	4510 gallons
	Temperature	112 deg F
c.	Boron concentration (wt%)	20%
	Volume	4540 gallons
	Temperature	100 deg F

d.	Boron concentration (wt%)	24%
	Volume	4590 gallons
	Temperature	60 deg F

Answer: c. [1.0]

Reference: TS 4.1.5 and Table 3.1, 5-1

Comment:

The lead-in to this question needs to have the word "bearing" deleted.

Question 10

MATCH the correct setpoints from Column B with the RHR system isolations of Column A. Items from Column B may be used more than once or not at all.

Column A	Column B
a. RHR shutdown cooling valves and head spray valves isolate.	1. High Drywell Pressure (1.39 psig)
b. Control solenoid valves to radwaste discharge valve (F203) isolate.	2. High RHR equipment area temperature (99 degrees F)
c. Sample lines (F060A/B and F075A/B), RHR shutdown cooling upper pool valve (F037A/B) isolate.	3. Vessel water level below +11.4 inches
d. Discharge to radwaste isolation valves (F040 and F049) isolate.	4. Vessel water level below -41.6 inches
	5. Vessel water level below -150.3 inches

Answer: a. 3, b. 4, c. 3, d. 3

Reference: OP-LO-SYS-LP-E12-05 L.O. #5.C.

Comment:

The list of setpoints in Column B contained correct wording for isolation parameters with incorrect setpoints in parentheses following the wording. This is misleading to the exam candidate, and the question becomes a test of the

candidate's ability to read the available selections.

It is recommended that this question be re-written prior to its next use.

Question 12

MATCH the rod block type from Column B with the RC&IS conditions in Column A. Items in Column B may be used more than once or not at all.

Column A	Column B
a. One rod selected and driving	1. Select Block
b. Rod Pattern Controller sequence violation (greater than 20% power)	2. Insert Block
	3. Withdrawal Block
c. IRM wrong position, detector not full in while in SHUTDOWN mode	4. No Rod Block
d. IRM range 2 and SRM downscale	

Answer: a. 1, b. 4, c. 3, d. 3

Reference: OP-LO-SYS-LP-C11-2, Rev. 1, Section IV

Comment:

Item "A" has two (2) correct answers. "One rod selected and driving" is a SELECT BLOCK, but it is not a ROD BLOCK. Therefore, selection 4, "No Rod Block" is also a correct answer.

It is requested that either answer be accepted as correct or that Part "A" be deleted.

Question 13

MATCH the correct Recirculation Flow Control Valve (FCV) response from Column B with the operating conditions from Column A. Assume the Recirculation Pumps are in fast speed. Items in Column B may be used more than once or not at all.

SRO EXAMINATION COMMENTS

Column A	Column B
a. Reactor water level DECREASES to level 4 and less than two feedwater pumps are running.	1. FCV limited to 102.5% drive flow MAXIMUM.
b. Position controller demand signal at zero percent indicated position.	2. FCV limited to 40% drive flow MINIMUM.
c. Drywell pressure INCREASES to HIGH DRYWELL PRESSURE (1.23 psig)	3. FCV at 40% open position (actual).
d. Hydraulic Power Unit (HPU) failure due to undervoltage condition.	4. FCV at 20% open position (actual).
	5. FCV runback.
	6. FCV motion inhibit.
	7. No FCV response.

Answer: a. 5, b. 4, c. 6, d. 7

Reference: OP-B33-2-501-2 pg 16 Table 2 Figure 1 & 2

Comment:

Item "D" refers to an undervoltage condition. It was not clear whether one or both subloops of the HPU were affected. A few candidates asked for clarification during the examination and were told that both subloops were affected. If a single subloop of the HPU experienced the undervoltage condition, the correct answer would be 7, no FCV response. If both subloops were experiencing the undervoltage condition, the correct answer is 6, FCV motion inhibit. Appropriate reference material is attached as documentation.

It is requested that either answer 6 or 7 be accepted for Part "D" or that Part "D" be deleted.

Question 18

During reactor operation the offgas post-treatment radiation monitor reaches the HIGH-HIGH setpoint.

LIST FOUR (4) valves in the offgas train that will automatically close, isolating the offgas system.

SRO EXAMINATION COMMENTS

Answer: 1N64-FV-F060, Offgas discharge to vent
F054, Prefilter inlet drain
F034 A/B, Condenser drain
F023, Holdup line drain

Reference: ONEP 05-1-02-II-2

Comment:

Answers 2, 3, & 4 are commonly called "loop seal isolation valves". Therefore, you may see the Offgas system discharge valve and 3 loop seal isolation valves as an answer.

It is recommended that a statement of "3 loop seal isolation valves" be accepted as correct for items 2, 3, & 4 of the answer key.

Question 19

LIST the FOUR (4) systems monitored by the Process Liquid Radiation Monitoring subsystem.

Answer: SSW system
CCW system
Radwaste
Alternate Decay Heat Removal system

Reference: OP-LO-SYS-D17 pg 34

Comment:

One of the four (4) systems listed in the answer key is the ADHR System. The process radiation monitor for the ADHR System is actually located on the PSW System.

It is requested that PSW or ADHR be accepted for one of the four systems.

Question 23

An employee must work on exposed and energized electrical equipment powered from a 4160 volt bus. You have been designated by the Control Room Shift Supervisor to be the qualified operator stationed at the isolation device for the equipment involved.

WHICH ONE (1) of the following additional requirements must be present at the electrical equipment work location?

a. Control of Hazardous Electrical Energy Work procedures.

b. Insulated electrical equipment grounding rod.

c. Rubber insulating mats on floor and surrounding equipment.

d. Direct communications with the control room.

Answer: d. [1.0]

Reference: 01-S-12-5 Rev 3 pg 5-6 section 6.3

Comment:

The question is confusing as written. It states that the candidate is the "qualified operator stationed at the isolation device for the equipment involved". The question asks for additional requirements that must be present at the electrical equipment work location. These are not necessarily the same location in the plant. The isolation device may be a feeder breaker located elsewhere in the plant. The correct answer for the person located at the isolation device is "D", direct communications. The correct answer for personnel at the work location is "C", rubber insulating mats.

It is recommended that either c. or d. be accepted as correct or this question should be deleted.

Question 25

WHICH ONE (1) of the following concerning minimum crew composition is required by the Technical Specifications?

a. A senior reactor operator is required during all operating conditions.

b. One shift crew position may be unmanned upon shift change for up to two hours due to an oncoming shift crewman being late of absent.

c. Two individuals with valid reactor operator licenses are required during Operating Conditions 1, 2, and 3.

d. An STA mat assume Control Room Command function for the Shift Superintendent during Operating Conditions 1, 2, and 3 providing the STA has a valid SRO license.

SRO EXAMINATION COMMENTS

Answer: c. [1.0]

Reference: TS Table 6.2.2.1

Comment:

The question has three (3) correct answers.

> A senior reactor operator is required during all operating conditions.
>
> Two individuals with valid reactor operator licenses are required during Operational Conditions 1, 2, & 3.
>
> An STA may assume Control Room Command function for the Shift Superintendent during Operational Conditions 1, 2, & 3 providing the STA holds a valid SRO license.

All three of these answers are correct.

It is recommended that either a, b, or c be allowed as acceptable answers or delete the question.

ENCLOSURE 4

NRC Resolution of Facility Comments
(Question RO/SRO)

(1) Question (2.09 / 5.07)

Comment accepted. The technical error in this question should have been identified in the pre-exam review. The question was deleted from the examinations.

(2) Question (2.15 / 5.13)

Comment accepted. Part (d) was deleted because there were two correct responses.

(3) Question (3.04 / 6.02)

Comment noted. This question is quite valid to ask within the topic of Plant Systems since it based on Level Indication response to the given plant conditions.

(4) Question (3.06 / 6.03)

Comment noted. The question will be modified before it is loaded into the EQB.

(5) Question (3.09 / ***)

Comment partially accepted. No change to the answer key was made since there was no apparent confusion of the candidates. The question will be modified prior to being loaded into the EQB.

(6) Question (3.15 / 6.10)

Comment noted. Incorrect setpoints were used for distractors to ensure that there was only ONE correct response for items in column A. If this is considered a significant deficiency, it should have been discussed during the pre-exam review.

(7) Question (3.17 / 6.12)

Comment accepted. Part (a) was deleted from the examinations.

(8) Question (3.18 / 6.13)

Comment partially accepted. The candidates were graded based upon information passed to them from the proctor, if applicable. Otherwise, the answer key remains unchanged.

(9) Question (3.25 / 6.18)

Comment accepted. Valve name, number, or "Loop seal isolation valves" will be acceptable.

(10) Question (3.26 / 6.19)

Comment accepted. Either PSW or ADHR will be accepted as one of the four systems. It is recommended that one single nomenclature be specified for this part of the Process Radiation Monitoring Subsystem and be included in the lesson plan.

(11) Question (3.30 / 6.23)

Comment accepted. The question was deleted from the examinations.

(12) Question (3.33 / 6.25)

Comment partially accepted. The question was deleted from the examinations due to the existence of more than one correct response. Part (d) of the question is not an acceptable answer based upon the copy of Tech Specs that was submitted for examination development. The copies submitted did not contain Amendment No. 64 for Table 6.2.2-1 which subsequently made part (d) a true statement. Materials sent for exam development MUST be copied from controlled copies which include the latest revisions and amendments to prevent this from happening in the future.

(13) Question (*** / 5.18)

Comment not accepted. The question specifically stated "PARTIAL loss" and requested the actions listed in ONEP 05-1-02-V-1. If confusion exists as to what actions an operator should perform, then the procedure should be changed to eliminate this confusion. No change to the answer key was made.

(14) Question (*** / 6.08)

Comment noted.

ENCLOSURE 5

Simulation Facility Report

Facility Licensee: NPF-29

Facility Docket No.: 50-416

Operating Tests Administered On: 12/19-21/89

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of non-compliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulator facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

During the conduct of the simulator portion of the operating tests, the following items were observed.

ITEM	DESCRIPTION
Telephone System	The communication systems used between the shift supervisor and the simulator operator inhibited information exchange between the operators and other support personnel that they were trying to contact. The simulator operator's phone would ring but would disconnect when the phone was answered. Throughout the examinations it took several attempts by the candidates to make the phone connections.