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

Report Nos.:	50-387/90-09 (OL) 50-388/90-09 (OL)
Docket Nos.:	50-387 50-388
License Nos.:	NPF-14 NPF-22
Licensee:	Pennsylvania Power & Light Company 2 North Ninth Street Allentown, Pennsylvania 18101
Facility Name:	Susquehanna Units 1 & 2
Examination At:	Berwick, Pennsylvania
Examination Dates:	April 9 - 13, 1990
Examiners:	T. Walker, Senior Operations Engineer C. Carroll, Sonalysts D. Odland, Sonalysts (Observer)

CHIEF EXAMINER: _____ 6-4-90
Theodore A. Easlick, Operations Engineer — Date

APPROVED BY: _____ 6/5/90
Richard J. Conte, Chief, BWR Section — Date
Operations Branch, Division of Reactor Safety

EXECUTIVE SUMMARY

Written examinations and operating tests were administered to three (3) senior reactor operator (SRO) candidates and six (6) reactor operator (RO) candidates. The SROs passed the operating tests but only two (2) passed the written test. The ROs passed the operating tests and the written tests.

The candidates were well prepared for the licensing examinations with the following exceptions. The SROs demonstrated a generic weakness in the area of the System Particulate, Iodine, and Noble Gas (SPING), Monitoring System. The weaknesses included an overall lack of understanding of the SPING system and an inability to obtain radioactive release rate data. This release rate information is essential to determine if Technical Specifications have been exceeded, for entry into Emergency Operating Procedures (EOPs), and to implement the Emergency Plan. An additional generic weakness was evident during the operating test. The direction from the SROs to initiate suppression pool cooling was not timely in many cases. This resulted in an unnecessary heatup of the suppression pool.

Deficiencies were identified in the reference material furnished by the licensee for the examination preparation. Some of the Units of Instruction did not contain sufficient information to meet the learning objectives. Other discrepancies noted in the Units of Instruction were a result of information that was incorrect due to recent plant modifications (see section 3.4).

DETAILS

1.0 INTRODUCTION AND OVERVIEW

The NRC examiners administered replacement examinations to three (3) senior reactor operator (SRO) upgrade candidates and six (6) reactor operator (RO) candidates. The examinations were administered in accordance with NUREG 1021, Rev. 5, dated January 1, 1989, Examiner Standards (ES).

Prior to administration of the written examinations, a pre-examination review was conducted at the facility training center. Present at the review was a member of training department staff, a shift supervisor (SRO) and members of the NRC examination team. The scenarios used for the examinations were run on the plant specific simulator, with the assistance of a facility supplied simulator operator, prior to being administered. All facility individuals involved with the review of the examination materials signed security agreements to ensure that there was no compromise of the examination.

2.0 PERSONS CONTACTED

2.1 U.S. Nuclear Regulatory Commission

S. Barber, Senior Resident Inspector

2.2 Pennsylvania Power & Light Company

*G. Stanley, Plant Superintendent
J. Blakeslee, Asst. Plant Superintendent
T. Markowski, Dayshift Supervisor
*W. Lowthert, Training Manager
*M. Peal, Operations Training Supervisor
*H. Palmer, Supervisor of Operations
B. Stitt, Initial Ops. Tng. Supervisor
D. Boyle, Shift Supervisor - Operations
J. Seek, Simulator Operator

(*)Denotes those present at the exit interview on April 13, 1990.

3.0 EXAMINATION RELATED FINDINGS AND CONCLUSIONS

3.1 Examination Results

	RO Pass/Fail	SRO Pass/Fail
Written	6 / 0	2 / 1
Operating	6 / 0	3 / 0
Overall	6 / 0	2 / 1

3.2 Operating Examination

The following is a summary of generic strengths and weaknesses noted on the operating tests. This information is being provided to aid the licensee in upgrading license and requalification training programs. No licensee response is required.

Strengths

- SROs command and control over crew performance.
- Use of Emergency Plan Implementing Procedures.
- Use of Technical Specifications by both ROs and SROs.
- Overall use of procedures.

Weaknesses

- Implementation of step RD-4, EO-100-112, Rapid Depressurization, for overriding ECCS IAW ES-149-001.
- Implementation of step PC/P-11, EO-100-103, Primary Containment Control, for initiating D.W. spray when below spray limit curve with no venting performed.
- Understanding of the SPING system and operation.
- Ability to determine gaseous effluent release rates and compare to T.S. limits.
- Knowledge of personnel radiation monitoring equipment.

- Direction to initiate suppression pool cooling when adding heat to suppression pool was not timely.

3.3 Written Examination

The following is a summary of generic strengths and weaknesses noted from the grading of the SRO and RO written examinations. This information is being provided to aid the licensee in upgrading license and requalification training programs. No licensee response is required.

Strengths

- Understanding of flux oscillations.
- Knowledge of basis for T.S. 3.9.9 Spent Fuel Pool Water Level.
- Knowledge of basis for resetting Main Generator Lockout after scram.
- Knowledge of basis for Emergency Operating Procedures (EOPs).
- Knowledge of EDG trips during a LOCA condition.
- Ability to determine ADS-SRV status given various plant conditions.
- Knowledge of RCIC System operations.
- Knowledge of RHR System valve interlocks.

(SRO ONLY)

- Use of Emergency Plan Implementation Procedures with regard to making Protective Action Recommendations.
- Use of Heat Capacity Temp. Limit (HCTL) Curve from EO-100-103 Primary Containment Control Procedure.
- Understanding of EOP flow chart symbols.

(RO ONLY)

- Knowledge of conditions when ECCS can be manually overridden.
- Understanding of EHC System operation given various plant conditions.
- Knowledge of Off-Normal Procedures.

Weaknesses

- Knowledge of AD-00-705 Access Control and Radiation Work Permit System.
- Knowledge of normal SRV tail pipe temperature and high temperature alarm setpoint.
- Ability to determine correct alarm status given off-normal APRM, RBM and flow indications.
- Knowledge of Off Gas Recombiner mode switch operation.
- Understanding of RWM operations.
- Knowledge of required SRM indications during fuel loading.
- Knowledge of Refueling Bridge interlocks.

(SRO ONLY)

- Knowledge of Core Spray pump starting permissives.
- Ability to determine which level transmitters/instruments may be the cause of a faulty indication (ON-145-004).
- Use of T.S. section 3.8.1, A.C. Sources.
- Emergency Classifications based on a LOCA with a containment isolation valve open.

(RO ONLY)

- Knowledge of RCIC components powered by 250 VDC.
- Knowledge of maximum RPV pressure with all SRVs open.
- Understanding of Feedwater Level Control System response to a failed level instrument.

3.4 Reference Material

During the preparation of the written examination some inadequacies in the reference material were noted by the examination team. The Units of Instruction, in some cases did not provide sufficient information to meet the objective as stated at the beginning of each unit. The 125 VDC unit (SY017 G-3), for example, contained only five pages and did not list the loads energized by the 125 VDC system.

There was also an indication that the Units of Instruction were not up to date with the current plant modifications. The RHR unit (SY017 C-1) and the Stator Water Cooling unit (SY017 A-5) both contained information that was incorrect due to recent system modifications.

The inadequacies in the training material resulted in two (2) post-examination comments by the licensee. (See Attachment 3 - Questions 10 and 30).

4.0 Exit Interview

On April 13, 1990, a pre-examination review was conducted at the facility training center. The licensee was informed that, although a post-examination review was not conducted, comments on the written examination would be accepted. These comments were received at the exit meeting. The licensee representatives that attended the meeting are listed in section 2.0 of this report.

The examination strengths and weaknesses identified in section 3.1 and the problems with the reference material identified in section 3.4 were discussed. The licensee agreed to review the Units of Instruction and resolve the identified problems.

The control room staff was very cooperative in maintaining an environment conducive for operating test administration.

Facility access went smoothly with good support from Health Physics and Security.

The final results of the examinations were not presented at the exit meeting, but would be contained in the Examination Report. Every effort would be made to send the applicant's results in approximately 30 working days.

Attachments:
1. Senior Reactor Operator Written Examination and answer key
2. Reactor Operator Written Examination and answer key
3. Facility Comments on Written Examination
4. NRC Response to Facility Comments
5. Simulation Facility Report

ATTACHMENT 1
Senior Reactor Operator Written Examination and answer key

MASTER

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

FACILITY: Susquehanna 1 & 2

REACTOR TYPE: BWR-GE4

DATE ADMINISTERED: 90/04/10

CANDIDATE:

INSTRUCTIONS TO CANDIDATE:

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

NUMBER QUESTIONS	TOTAL POINTS	CANDIDATE'S POINTS	CANDIDATE'S OVERALL GRADE (%)
~~85~~ w/in 10 84	~~100.00~~ w/in 10 99.00		

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

Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

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

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

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

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

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

6. You should write your answers on the examination question page.

7. If 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.

8. Print your name in the upper right-hand corner of the first page of answer sheets. Initial each of the following answer pages including any additional sheets.

9. If you use any separate sheets, number each answer and skip at least 3 lines between answers to allow space for grading.

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

11. 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.

12. 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.

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

14. 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.

15. 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.

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

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

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

19. 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.)

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

QUESTION: 001 (1.00)

A special approval sequence is designated for issuing a permit clearance with the permit holder unavailable.

WHICH ONE (1) of the following correctly describes this approval sequence?

a. Permit holder's designee, Shift Supervisor, Plant Manager

b. System Operating (S.O.) Representative, Shift Supervisor, Supervisor of Operations

c. Permit holder's supervisor, Shift Supervisor, Plant Manager

d. Permit holder's supervisor, Shift Supervisor, Supervisor of Operations

QUESTION: 002 (1.00)

The 'A' CRD pump motor has a yellow tag on it.

WHICH ONE (1) of the following is correct concerning operation of the CRD pump?

a. The pump cannot be operated except at the request of the permit holder.

b. If the restrictions written on the tag are not met, the pump can be operated only with the permission of Shift Supervision.

c. The restrictions on the tag must be met to ensure personnel protection when operating the pump.

d. The pump can only be operated on the orders of the System Operating (S.O.) Representative.

QUESTION: 003 (2.50)

An operator is required to perform a valve lineup verification. None of the valves that need verification have any open/close position indication directly on the valve.

For EACH of the valve status conditions in Column A, SELECT the proper verification action from Column B. Verification actions from Column B may be used once, more than once or not at all.

COLUMN A (VALVE STATUS)	COLUMN B (VERIFICATION ACTION)
a. Manual valve in open position	1. Observe stem position
b. Manual valve in shut position	2. Observe remote position indication.
c. Electrically operated valve in shut position	3. Check in shut direction and return to required position, if applicable
d. Lockwired flow balance valve	4. Check in open direction and return to required position, if applicable
e. Manual valve in locked open position	5. Unlock valve and check in shut direction and return to required position, if applicable
	6. Unlock valve and check in open direction and return to required position, if applicable
	7. Verify lock intact

QUESTION: 004 (2.00)

Procedure AD-QA-300, Conduct of Operations, specifies actions that must be taken when starting large electrical loads.

a. WHAT size loads are classifed as "Large Electrical Loads"? (Express answer in VAC) (0.5)

b. STATE the THREE (3) actions that must be performed prior to starting a large load. (0.5 each)

QUESTION: 005 (1.00)

The Hot Work Firewatch should stay on the job site during all cutting, welding, or grinding and for _____ after work is complete.

WHICH ONE (1) of the following correctly completes this statement?

a. 15 minutes

b. 30 minutes

c. 45 minutes

d. 60 minutes

QUESTION: 006 (1.00)

WHICH ONE (1) of the following is NOT correct concerning working with hydrogen in accordance with OP-074-001, "Hydrogen System Storage"?

a. Smoking or open flame is not allowed within 50 feet of hydrogen storage areas.

b. Explosive meters to monitor atmosphere are required only when working around hydrogen in enclosed areas.

c. Special tools are required when making hydrogen gas piping connections because they have reverse threads.

d. Connections should be made before opening hydrogen supply valves to prevent self-ignition of hydrogen.

QUESTION: 007 (1.00)

WHICH ONE (1) of the following jobs would NOT require a Radiation Work Permit (RWP) in accordance with AD-00-705, "Access Control and Radiation Work Permit System?"

a. Radiography performed following repairs to piping in the Service Water System.

b. Inspection of equipment in an Airborne Radioactivity Area. No work will be performed.

c. Repairs to an RHR pump that are expected to take 2 workers approximately 3 hours to complete. Radiation levels in the area are 5 mr/hr.

d. Welding of piping in the CRD System. Contamination levels on the piping are 200 dpm/cm2. The highest contaminatin levels in the room are 1200 dpm/cm2.

QUESTION: 008 (1.00)

Unit 1 is operating at 95% power at the 100% rod line when the "B" Recirculation Pump trips.

WHICH ONE (1) of the following conditions (if the condition occurred after the pump trip) would require a reactor scram?

a. Operation above the 80% rod line.

b. Operating loop drive flow greater than 37000 gpm.

c. LPRM oscillations of 10 w/cm2 peak to peak on a five second period.

d. Two or more APRM UPSCALE rod block alarms cycling on a five second period.

QUESTION: 009 (1.00)

WHICH ONE (1) of the following statements is NOT correct concerning core flux oscillations?

a. If out of phase power oscillations occur, the MCPR Safety Limit may be violated.

b. Out of phase power oscillations could lead to high local neutron flux levels without an automatic Scram.

c. Region II of the Power/Flow map must be exited IMMEDIATELY if entered.

d. Region II of the Power/Flow map has a higher probability of thermal hydraulic instabilities occurring than Region I.

QUESTION: 010 (1.00)

Unit 1 is operating at 85% power and experiences a problem with the Main Generator Stator Water Cooling system. Conditions are as follows:

"A" Stator Water Cooling Pump	- Tripped
"B" Stator Water Cooling Pump	- Running
Stator Cooling outlet temperature	- 79 degrees Celsius
Stator Cooling water inlet pressure	- 10 psig
Stator Cooling Tank level	- 10" below normal and decreasing

SELECT the ONE correct statement from those below.

a. The load on the Main Generator must be reduced below 24% in 70 seconds or the main turbine will trip.

b. The main turbine will automatically trip 70 seconds after the Stator Cooling water inlet pressure dropped below 13 psig.

c. The main turbine will automatically trip 70 seconds after the Stator Cooling outlet temperature reached 75 degrees Celsius.

d. The main turbine will automatically trip if the "B" Stator Water Cooling Pump trips after a 70 second time delay.

QUESTION: 011 (1.00)

WHICH ONE (1) of the following statements is correct concerning operation of the Emergency Service Water (ESW) system under degraded conditions?

a. ESW cannot meet design specifications with only three ESW pumps available for service.

b. System redundancy is ensured with three ESW pumps available because there is at least one pump available in each loop.

c. Any two ESW pumps will provide adequate cooling for four operating diesel generators.

d. Preferred operation with only two ESW pumps available is two ESW pumps in one loop.

QUESTION: 012 (1.00)

Unit 1 is operating at 100% power with A CRD pump tagged out for maintenance. Group 1 and Group 2 rods are completely withdrawn from the core. The following alarms are received in the control room:

CRD PUMP B TRIP
CRD PUMP B SUCTION LO PRESS
ACCUMULATOR TROUBLE LIGHTS (1 rod in Group 1 and 1 rod in Group 2)

WHICH ONE (1) of the following actions should the reactor operator take?

a. Monitor the FULL CORE DISPLAY for additional trouble lights.

b. Check Condensate Storage Tank (CST) level above 45%.

c. Bypass the suction filter and restart B CRD pump.

d. Scram the reactor.

QUESTION: 013 (1.00)

ON-118-001, "Loss of Instrument Air," requires a manual scram if air pressure cannot be restored and maintained above 65 psig.

WHICH ONE (1) of the following statements correctly describes the bases for this scram?

a. A scram at this point ensures that the reactor scram will be successful because Scram Discharge Volume (SDV) in-leakage from the drifting open of scram inlet and outlet valves could prevent a scram at a later time.

b. A scram at this point places the plant in a stable condition which allows the operators to direct their attention to other plant safety-related equipment that is affected by the loss of air.

c. A scram at this point prevents core flux oscillations which could result as the scram inlet and outlet valves drift open causing the control rods to insert at different times.

d. A scram at this point anticipates the reactor water level control problems that will result from the effects of the loss of air on the Feedwater and Condensate systems.

QUESTION: 014 (1.00)

Technical Specification 3.9.9 requires at least 22 feet of water be maintained over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.

WHICH ONE (1) of the following is the bases for this requirement?

a. This level ensures adequate flow through the skimmer surge tanks to remove irradiated fuel decay heat.

b. This level ensures that 99% of the iodine released from the rupture of an irradiated fuel assembly well be removed by the water.

c. This level ensures that the radiation level at the surface of the pool will not exceed 10 mrem/hr.

d. This level ensures that an irradiated fuel assembly raised to the upper limit on the refueling hoist, will not expose the bridge operator to more than 10 mrem/hr.

QUESTION: 015 (1.00)

Unit 1 is at 180^F with the mode switch in SHUTDOWN. One loop of RHR is inoperable due to a problem with RHR Service Water. The other loop of RHR was operating in Shutdown Cooling mode when a spurious signal caused the Shutdown Cooling isolation valves to close.

WHICH ONE (1) of the following methods is an acceptable means of immediately establishing reactor coolant circulation in accordance with ON-149-001, "Loss of RHR Shutdown Cooling Mode?"

a. Maintain RPV level above 40 inches to establish natural circulation.

b. Establish a "feed and bleed" flowpath with the Condensate System and Reactor Water Cleanup (RWCU) Letdown.

c. Operate the Core Spray system to feed the RPV from the suppression pool and reject through 6 SRVs.

d. Operate the Reactor Recirculation system with at least one pump at approximately 30% pump speed in accordance with OP-164-001.

QUESTION: 016 (1.00)

In accordance with EO-100-030, "Unit 1 Response to Station Blackout," WHICH ONE (1) of the following describes the systems that should be used to depressurize the RPV during a prolonged Station Blackout?

a. RCIC and HPCI

b. RCIC and up to 10 SRVs

c. HPCI and up to 10 SRVs

d. HPCI and up to 6 SRVs

QUESTION: 017 (1.00)

A fire in the cable spreading room has forced the control room to be abandoned.

WHICH ONE (1) of the following actions, as a minimum, is required to be performed prior to leaving the control room to ensure Safe Shutdown capabilities?

a. Place MODE SWITCH in SHUTDOWN

b. Insert SRM's and IRM's

c. Close MSIV's

d. Close RFP discharge valves

QUESTION: 018 (1.00)

EO-100-009, "Plant Shutdown from Outside the Control Room," directs the operator to place the Instrumentation Transfer switches on the Remote Shutdown Panel to the EMERG position. This bypasses the Main Control Room devices.

WHICH ONE (1) of the following is the reason for bypassing the Control Room controls?

a. Enables automatic protective features that may have been damaged in the fire.

b. Prevents spurious equipment operation.

c. Prevents further damage to equipment electrical systems.

d. Precludes problems of mutual inductance in long cable runs.

QUESTION: 019 (2.00)

The reactor is operating at 30% power when condenser vacuum begins to decrease.

For each of the automatic actions in Column A, SELECT the setpoint at which the action occurs from Column B. Items in Column B may be used once, more than once or not at all.

COLUMN A (ACTIONS)		COLUMN B (SETPOINTS)
a.	Main turbine TRIP	1. 7.4" inches Hg Absolute
b.	Turbine bypass valves CLOSE	2. 8.2" inches Hg Absolute
c.	Main Steam Line ISOLATION	3. 10.5" inches Hg Absolute
d.	Reactor Feed Pump turbine TRIP	4. 12.5" inches Hg Absolute
		5. 19.7" inches Hg Absolute
		6. 22.9" inches Hg Absolute
		7. 23.4" inches Hg Absolute

QUESTION: 020 (1.00)

EO-100-101, "Scram", directs the operator to reset the main generator lockout if conditions permit in accordance with ON-193-002, "Main Turbine Trip."

SELECT the correct bases for this step from the reasons listed below.

a. To allow the Recirc pumps to be restarted to establish forced reactor coolant circulation.

b. To prevent a trip of the Stator Water Cooling pumps.

c. To allow the Stator Water Cooling pumps to be restarted to provide cooling to the main generator.

d. To prevent a plant auxiliary load shed.

QUESTION: 021 (2.00)

Unit 2 is operating at 87% reactor power. Main Steam Line radiation levels are 9 times Normal Full Power Background (NFPB) and increasing. No automatic actions have occurred.

STATE ALL the immediate operator actions required.

QUESTION: 022 (1.00)

WHICH ONE (1) of the following is NOT one of the reasons why ADS valves are preferred for rapid RPV depressurization?

a. ADS discahrge distribution will minimize uneven suppression pool heatup.

b. All 6 ADS valves can be opened simultaneously using the manual initiation pushbuttons.

c. The ADS system was designed to rapidly reduce pressure and not apply undue stress to the pressure vessel and internals.

d. The ADS valves have a more reliable pneumatic supply than the other SRVs.

QUESTION: 023 (1.00)

EO-100-112, "Rapid Depressurization", directs the operator to use alternate depressurization means if Suppression Pool level is below five (5) feet.

SELECT the reason for this requirement.

a. At 5 feet, level is below the Suppression Pool temperature detectors resulting in inaccurate temperature readings.

b. With level below 5 feet, there is insufficient heat capacity in the suppression pool to assure steam condensation.

c. Downcomer vent lines are uncovered at 5 feet, resulting in loss of pressure suppression capabilities.

d. SRV discharge line spargers are not adequately submerged at 5 feet to prevent containment overpressurization.

QUESTION: 024 (1.00)

EO-103, "Primary Containment Control," directs the operator to run drywell coolers in slow if hydrogen concentration is above 3% by volume.

SELECT the correct bases for running drywell coolers in this situation.

a. Drywell cooling will cause condensation of the hydrogen and oxygen reducing the pressure in the drywell.

b. Drywell cooling increases the efficiency of the hydrogen recombiners in reducing hydrogen concentration.

c. Drywell cooling will mix the drywell atmosphere to avoid pockets of high hydrogen concentrations.

d. Drywell cooling and the resultant lower temperature reduces the chances of ignition of the hydrogen.

QUESTION: 025 (1.00) deleted due to facility comment

WHICH ONE (1) of the following conditions would require a reactor scram in accordance with EO-100-104, "Secondary Containment Control?"

a. An area radiation level exceeds the "Max Normal" level.

b. An area radiation level exceeds ten times the alarm level.

c. An area radiation level exceeds ten times the "Max Normal" level.

d. A primary system required to shutdown the reactor discharging into an area resulting in area radiation levels above the "Max Normal" level.

QUESTION: 026 (1.00)

Given the following initial conditions:

- Reactor Power at 25%
- Generator output at 25%
- Reactor Pressure at 931.5 psig
- Throttle Pressure at 927.5 psig
- EHC Pressure Setpoint set at 920 psig
- Load Selector set at 30%
- Load Limit set at 100%
- Maximum Combined Flow set at 105%
- Recirc pumps in manual operating at 30% speed
- Synchronous Speed Selected
- Not on the bypass jack
- Pressure regulator "A" in control

WHICH ONE (1) of the following correctly describes the plant response if the "B" pressure regulator output fails high? (Refer to Figure 1)

a. The bypass valves will open. Reactor pressure will increase and the reactor will stabilize at a higher power level.

b. The bypass valves will remain as is. Reactor pressure will increase and the reactor will scram on an APRM upscale trip.

c. The bypass valves will open. Reactor pressure will decrease and the reactor will scram on MSIV closure due to low pressure.

d. The bypass valves will remain as is. Reactor pressure will not change because pressure regulator "A" is in control.

QUESTION: 027 (3.00)

For each of the conditions given in Column A, SELECT ALL of the components/systems from Column B which receive an isolation signal as the parameter changes from normal value to the present condition. Consider each condition seperately. (at 100% power)

Note: The responses from Column B may be used once, more than once, or not at all. If none of the components/systems receive an isolation signal, select NONE.

COLUMN A (Condition)		COLUMN B (Component/System)	
a.	Reactor Water Level: -120 inches	1.	MSIVs
b.	Reactor Pressure: 400 psig (Mode Switch in SHUTDOWN)	2.	RBCCW to Drywell Coolers
c.	Drywell Pressure: 2.5 psig	3.	RBCCW to Recirc Pumps
d.	Main Steam Line Flow: 110 psid	4.	Reactor Coolant Sample Valves (FO19 & FO20)
e.	Main Steam Line Radiation: 7.5 x NFPB	5.	RHR Sample Valves (FO79 & FO80)
f.	Main Steam Line Tunnel Temp: 170^F	6.	RHR Shutdown Cooling Suction Valves (FO08 & FO09)
		7.	NONE

QUESTION: 028 (1.00)

A small break LOCA has occurred, causing the Emergency Diesel Generators to auto start on high drywell pressure. Emergency Diesel Generator 'A' trips shortly after startup.

WHICH ONE (1) of the following would cause 'A' Emergency Diesel Generator to trip under these conditions?

a. High jacket water temperature.

b. Engine overspeed.

c. Low Turbocharger oil pressure.

d. Generator overvoltage.

QUESTION: 029 (1.00)

The reactor is operating at 100% power when a Rod Drift alarm on rod 18-19 is received.

WHICH ONE (1) of the following is a potential cause for the rod drift?

a. Low Instrument Air system pressure.

b. Automatic start of the standby CRD pump.

c. Overcharged nitrogen accumulator.

d. Leaking piston seal on scram accumulator.

QUESTION: 030 (1.00)

The reactor is operating at 75% power when 125 VDC panel 1D614 is deenergized. A reactor scram signal on Reactor Protective System channels "A" and "B" is then received.

WHICH ONE (1) of the following correctly describes the response of the Control Rod Hydraulic System?

a. Scram pilot valves energize to vent air header.

b. Scram pilot valves fail "as is".

c. Backup scram valves energize to vent air header.

d. Backup scram valves fail "as is".

QUESTION: 031 (1.00)

During normal power operations, the temperature of the downstream piping of an SRV valve should be approximately _____. In the event of an SRV leaking past its closed seat, the temperature of the downstream piping will increase. In this case, an alarm will actuate at a downstream piping temperature of _____.

WHICH ONE (1) of the following sets of temperatures correctly completes these statements?

a. 85 degrees F, 225 degrees F

b. 135 degrees F, 225 degrees F

c. 85 degrees F, 250 degrees F

d. 135 degrees F, 250 degrees F

QUESTION: 032 (1.00)

Unit 1 has experienced a valid automatic initiation of the Automatic Depressurization System (ADS). Plant conditions are as follows:

- Drywell pressure: 1.2 psig
- Reactor water level: -147 inches
- Reactor pressure: 150 psig
- RHR pumps: All running
- Core Spray pumps: All running
- ADS SRVs: 6 open
- 102 second timer: timed out
- 7 minute timer: timed out

WHICH ONE (1) of the following will cause the ADS SRVs to close?

a. The low pressure ECCS pumps raise reactor water level to -20 inches and both ADS LOGIC TIMER RESET buttons are depressed.

b. The ADS manual inhibit switches are placed in "inhibit" after reactor water level is raised above Level 1 (-129").

c. Drywell pressure decreases to 0.9 psig and both ADS High Drywell Pressure Initiation Reset buttons are depressed.

d. All RHR and Core Spray pumps are secured.

QUESTION: 033 (1.00)

While manually starting the RCIC system, the reactor operator is unable to increase turbine speed above 700 rpm.

WHICH ONE (1) of the following conditions could be a cause of this problem?

a. Steam supply pressure of 150 psig.

b. Failure of the ramp generator.

c. Failure of the low signal selector.

d. Improper reset of the trip throttle valve.

QUESTION: 034 (1.00)

A RCIC turbine trip occurred and the procedure has just been completed to reset the trip. No RCIC initiation signal is present.

WHICH ONE (1) of the following indications on the 4 position indication lamps above the handswitch for the RCIC turbine trip and throttling valve would indicate that the trip was reset properly and the RCIC turbine is ready to operate?

a. Both amber lamps illuminated, both red lamps extinguished.

b. Both amber lamps extinguished, both red lamps illuminated.

c. One amber lamp and one red lamp illuminated.

d. Both amber lamps and both red lamps illuminated.

QUESTION: 035 (1.00)

Reactor Recirculation flow is 60% when the reactor recirculation pumps runback to 45% without any operator actions.

WHICH ONE (1) of the following could have caused the recirculation pump runback?

a. Reactor steam flow < 20% and reactor water level < 13 inches.

b. RFP 'A' feed flow < 20% and reactor water level < 30 inches.

c. RFP 'B' feed flow < 20% and reactor water level < 13 inches.

d. Reactor steam flow < 20% and reactor water level < 30 inches.

QUESTION: 036 (1.00)

When operating with only one Reactor Recirculation pump running, erroneous flow indications may be observed.

WHICH ONE (1) of the following correctly describes the reason for the erroneous flow indications?

a. The flow summer (FY-1K607) only measures flow in the operating loop resulting in erroneous indicated core flow.

b. With jet pump flow > 38 x 10^6 lm/hr, forward flow in the non-operating loop is not accounted for resulting in indicated flow lower than actual core flow.

c. With jet pump flow < 38 X 10^6 lm/hr, forward flow in the non-operating loop is not accounted for resulting in indicated flow lower than actual core flow.

d. With jet pump flow < 38 x 10^6 lm/hr, reverse flow in the non-operating loop is not accounted for resulting in indicated flow higher than actual core flow.

QUESTION: 037 (1.00)

The reactor is operating at 100% power and reactor pressure is 1005 psig. Reactor Recirculation Pump Lower Seal pressure is 1150 psig and Upper Seal pressure is 850 psig.

These indications are indicative of _____. (Choose ONE)

a. Normal system parameters.

b. Failure of the Upper Seal

c. Failure of the Lower Seal.

d. Failure of both the Lower and Upper Seals.

QUESTION: 038 (1.00)

A plant startup is in progress. Reactor pressure is 400 psig. The Feedwater Low Flow Controller (LIC-R602) has just been placed in automatic and adjusted to control at 30 inches.

WHICH ONE (1) of the following describes the response of LV-10641 and the effect on reactor water level if air is lost to Startup Level Control valve LV-10641?

a. LV-10641 fails open increasing reactor water level.

b. LV-10641 fails open decreasing reactor water level.

c. LV-10641 fails closed increasing reactor water level.

d. LV-10641 fails closed decreasing reactor water level.

QUESTION: 039 (1.00)

The plant is operating at 100% power with the Feed Water Level Control System (FWLC) operating in three element control and the Level Select Switch on panel 1C651 selected to instrument "A". A malfunction in the FWLC system occurs such that reactor water level decreases and stabilizes at a lower reactor water level.

WHICH ONE (1) of the following instrument failures could have caused this problem?

a. "A" reactor water level instrument fails low.

b. "B" reactor water level instrument fails high.

c. "A" steam flow instrument fails high.

d. "B" steam flow instrument fails low.

QUESTION: 040 (1.00)

Consider the following information:

- The reactor is at 5% power
- APRM CHANNEL A is reading 5%
- APRM CHANNEL E is reading 5%
- APRM CHANNEL F is reading 4%
- IRM CHANNEL A is reading 105%
- IRM CHANNEL G is reading 106%
- IRM CHANNEL H is reading 125%
- The Mode Selector Switch is in STARTUP.

WHICH ONE (1) of the following correctly describes the automatic actions that should occur?

a. Rod block but no half scram

b. Half scram but no rod block

c. Rod block and half scram

d. No rod block and no half scram

QUESTION: 041 (1.00)

Consider all the following information:

- The reactor is at 100% power
- APRM CHANNEL A is reading 103%
- RBM CHANNEL A is reading 97%
- RBM CHANNEL B is reading 99%
- FLOW DRAWER A output is 90%
- FLOW DRAWER B output is 95%
- FLOW DRAWER C output is 102%
- FLOW DRAWER D output is 98%
- 5 LPRM signals to APRM CHANNEL A are bypassed (3 level A, 2 level B)
- RBM alarm ref. set high

WHICH ONE (1) of the following alarms would be received?

a. RPS CHANNEL A1/A2 AUTO SCRAM

b. APRM UPSCALE

c. APRM CHAN A, C, E, UPSCALE OR INOP TRIP

d. RBM UPSCALE OR INOP ROD BLOCK

QUESTION: 042 (1.00)

With the meter function switch in COUNT, the meter on the Power Range Monitoring Cabinet for APRM "C" reads 80%.

WHICH ONE (1) of the following statements is correct concerning the number of operable LPRMs on APRM "C"?

a. 80% of the Technical Specification required LPRMs for APRM "C" are operable.

b. Eight (8) LPRMs for APRM "C" are operable.

c. Sixteen (16) LPRMs for APRM "C" are operable.

d. The meter function switch must be taken to the "A", "B", "C", and "D" positions to determine the number of operable LPRMs for APRM "C".

QUESTION: 043 (1.00)

A TIP Trace is being taken on Unit 1 when a Reactor Feedwater pump trip occurs causing reactor water level to drop below Level 3 (+13 inches).

WHICH ONE (1) of the following correctly describes the response of the TIP system?

a. The TIP Shear Valve automatically fires to cut the detector cable and seal the guide tube.

b. The TIP Guide Tube Ball Valve automatically closes, cutting the detector cable and sealing the guide tube.

c. The TIP will go to the Manual Reverse Mode and withdraw, allowing the Ball Valve to close to seal the guide tube.

d. No automatic actions occur.

QUESTION: 044 (1.00)

WHICH ONE (1) of the following components internal to the reactor vessel assures that adequate core flow is provided to the high powered fuel bundles?

a. Peripheral Fuel Support

b. Orificed Fuel Support

c. Fuel Channel

d. Incore Guide Tube

QUESTION: 045 (1.00)

Unit 2 is operating at 45% power with Condensate Pumps "A", "B", and "D" in service. A Loss of Coolant Accident (LOCA) occurs simultaneously with a Main Generator Lockout.

WHICH ONE (1) of the following correctly describes the response of the condensate pumps?

a. The "A" and "B" Condensate pumps will trip immediately while the "D" pump will remain running.

b. All three running Condensate pumps will trip immediately and the "C" pump can be manually started after a 25-30 second time delay.

c. The "A" and "B" Condensate pumps will trip immediately and the "D" pump will trip after a 25-30 second time delay.

d. All three running Condensate pumps will trip immediately and the "D" pump will auto start after a 25-30 second time delay.

QUESTION: 046 (1.00)

The Unit 1 Off Gas Recombiner is being placed in service in accordance with OP-172-001, "Off Gas System." The recombiner is in STANDBY mode.

WHICH ONE (1) of the following actions occurs when the Unit 1 Off Gas Recombiner STANDBY/PRESTART mode switch is taken to "PRESTART?"

a. Recycle valve HV-16904 opens.

b. Off Gas isolation protection circuits are enabled.

c. STANDBY mode is "sealed in" (OFF/STANDBY mode switch disabled).

d. Heat trace piping high temperature alarms are disabled.

QUESTION: 047 (1.00)

All rods in Group 1 are fully inserted except rod 14-19, which is fully witdrawn. All rods in group 2 and 3 are fully withdrawn. All rods in group 4 are at position 42. All rods in group 5 through 9 are fully inserted. The Rod Worth Minimizer system has been initialized. Note: A list of the rod groups with the assigned rods, insert limits and withdraw limits is attached as Figure 2.

WHICH ONE (1) of the following rods will be displayed in the withdraw error window?

a. 14-19

b. 14-31

c. 18-23

d. 22-15

QUESTION: 048 (1.00)

All rods in Group 1 are fully inserted except rod 14-19, which is fully witdrawn. All rods in group 2 and 3 are fully withdrawn. All rods in group 4 are at position 42. All rods in group 5 through 9 are fully inserted. The Rod Worth Minimizer system has been initialized. Note: A list of the rod groups with the assigned rods, insert limits and withdraw limits is attached as Figure 2.

WHICH ONE (1) of the following control rods can be moved?

a. 14-19

b. 14-35

c. 22-15

d. 22-31

QUESTION: 049 (1.00)

WHICH ONE (1) of the following conditions will cause all SRM rod blocks to be bypassed?

a. All IRM's on range 3 or above.

b. SRM's read greater than 100 counts.

c. All IRM's are on range 8 or above.

d. SRM's read greater than 2 X 10^5 counts.

QUESTION: 050 (1.00)

During fuel loading with nine (9) or more bundles loaded into the core, the SRMs are required to read . . . [CHOOSE ONE]

a. at least 3.0 counts per second AND have a signal to noise ratio of greater than 2.0.

b. at least 3.0 counts per second OR at least 0.7 counts per second if the signal to noise ratio is less than 2.0.

c. at least 3.0 counts per second OR at least 0.7 counts per second if the signal to noise ratio is greater than 2.0.

d. at least 0.7 counts per second OR at least 3.0 counts per second if the signal to noise ratio is greater than 2.0.

QUESTION: 051 (1.00)

The Refueling Bridge is located over the Spent Fuel Pool during Unit 1 refueling operations. Unit 1 plant conditions are as follows:

- ONE (1) control rod is withdrawn
- Reactor selector switch is in NORMAL
- Refueling platform is heading toward the Unit 1 reactor

WHICH ONE (1) of the following conditions will allow bridge motion in the REVERSE direction?

a. Refueling switch #1 is activated and the main hoist is loaded to 600 pounds.

b. External switch in the Control Room is in STARTUP and refueling switch #2 is activated.

c. External switch in the Control Room is in STARTUP and the frame mounted auxiliary hoist is loaded to 250 pounds.

d. Refueling switch #1 is activated and the monorail auxiliary hoist is loaded to 450 pounds.

QUESTION: 052 (1.00)

Both units were operating at 100% power when a Loss of Coolant Accident (LOCA) occurred on Unit 2. Note: All systems were lined up in the normal configuration for 100% power operation.

WHICH ONE (1) of the following correctly describes the response of reactor building ventilation and the Standby Gas Treatment system (SGTS)?

a. Reactor Building Zones II and III isolate. SGTS fans "A" and "B" start.

b. Reactor Building Zone II isolates. SGTS fan "A" starts.

c. Reactor Building Zones I, II and III isolate. SGTS fans "A" and "B" start.

d. Reactor Building Zones II and III isolate. SGTS fan "B" starts.

QUESTION: 053 (1.00)

Unit 1 is operating the "A" Residual Heat Removal system in the Shutdown Cooling Mode. Reactor water level begins decreasing and reaches +13 inches.

WHICH ONE (1) of the following correctly describes the effect on the RHR system?

a. F047A (RHR Heat Exchanger Inlet) closes, F020 (Head Spray Shutoff) closes, F008 and F009 (Shutdown Cooling Suctions) close

b. F015A (RHR Injection) closes, F022 (Head Spray Shutoff) closes, F006A and F006C (Shutdown Cooling Suctions) close

c. F015A (RHR Injection) closes, F023 (Head Spray Flow Control) closes, F008 and F009 (Shutdown Cooling Suctions) close

d. F048A (RHR Heat Exchanger Bypass) opens, F023 (Head Spray Flow Control) closes, F006A and F006C (Shutdown Cooling Suctions) close

QUESTION: 054 (1.00)

In preparation for startup of shutdown cooling, OP-149-002, "RHR Operation in Shutdown Cooling Mode", requires a check of the suppression pool/shutdown cooling suction valve interlock.

WHICH ONE (1) of the following correctly describes this interlock?

a. The F004 valve (Suppression Pool Suction) cannot be opened with the respective F006 valve (Shutdown Cooling Suction) open to prevent draining the reactor vessel to the suppression pool.

b. The F006 valve (Shutdown Cooling Suction) cannot be opened with the respective F024 valve (Test Line Return) open to prevent pumping reactor vessel water into the suppression pool.

c. The F008 and F009 valves (Shutdown Cooling Suction) cannot be opened with any of the F004 valves (Suppression Pool Suction) open to prevent draining the reactor vessel to the suppression pool.

d. The RHR pump cannot be started unless the respective F004 valve (Suppression Pool Suction) and F006 valve (Shutdown Cooling Suction) are open to ensure adequate Net Positive Suction Head (NPSH) for the pump.

QUESTION: 055 (1.00)

Unit 1 is operating both Residual Heat Removal systems in the Suppression Pool Cooling Mode providing maximum cooling. A spurious Division I LPCI initiation signal is received.

WHICH ONE (1) of the following correctly describes the lineup of the RHR systems following the spurious signal?

a. F015A (RHR Injection) open, F028A (Suppression Chamber Spray Test Shutoff) open, F031A (Recirc Pump "A" Discharge) closed

b. F015A (RHR Injection) open, F024A (Test Return) closed, F028A (Suppression Chamber Spray Test Shutoff) closed

c. F015B (RHR Injection) open, F024B (Test Return) closed, F031A (Recirc Pump "A" Discharge) closed

d. F015B (RHR Injection) open, F024A (Test Return) closed, F048B (RHR Heat Exchanger Shell Side Bypass) closed

QUESTION: 056 (3.00)

For EACH of the conditions/situations in Column A, LIST ALL of the Emergency Operating Procedures from Column B that should be entered. Consider each condition separately. Each procedure from Column B may be used once, more than once, or not at all. If no procedure should be entered, select None Applicable.

COLUMN A (Conditions)	COLUMN B (Emergency Operating Procedures)
a. Suppression Pool Temperature at 108^F	1. EO-102, "RPV Control"
b. HPCI Equipment Room Temperature at 150^F	2. EO-103, "Primary Containment Control"
c. Drywell Pressure at 3.5 psig	3. EO-104, "Secondary Containment Control"
d. RCIC Steam Flow at 180 inches of water	4. EO-105, "Radioactivity Release Control"
e. Zone III HVAC Exhaust Radiation at 5.0 mr/hr	5. None Applicable
f. Total Site Release Rates of I-131 - 2.5 E+2 uCi/min Particulate - 7.5 E+4 uCi/min Noble Gases - 9.5 E+4 uCi/min	

QUESTION: 057 (2.50)

For each of the conditions listed in Column A, SELECT the type of controlled area from Column B. Items from Column B may be used once, more than once or not at all.

COLUMN A (CONDITIONS)	COLUMN B (CONTROLLED AREAS)
a. 250 mr/hr	1. Contaminated Area
b. 600 mr/hr	2. High Radiation Area
c. 400 dpm/cm2 alpha	3. Double-locked High Radiation Area
d. 10 R/hr	4. Radiation Area
e. 1200 dpm/cm2 beta-gamma	5. Locked High Radiation Area
	6. Airborne Radioactivity Area
	7. Uncontrolled Area

QUESTION: 058 (2.00)

For each of the operating activities in Column A, SELECT the action from Column B that is required in accordance with AD-QA-300, "Conduct of Operations." Items in Column B may be used once, more once or not at all.

COLUMN A (ACTIVITIES)	COLUMN B (ACTIONS)
a. Application of blocking on a non safety related system	1. Verification
b. Checking a locked open valve in a non safety related system during performance of a system checkoff list	2. Confirmation
c. Restoration of removed fuses in a non safety related system	3. System Test Verification
d. Clearing blocking on a safety related system in a Locked High Radiation Area	4. Independent Verification
	5. No action required

QUESTION: 059 (1.00)

WHICH ONE (1) of the following procedure changes can be authorized for implementation prior to approval by the Plant Superintendent?

a. A change to add performance of a test not described in the FSAR on a system described in the FSAR.

b. A change that may increase the probability of occurence of an accident that has been evaluated in the FSAR.

c. A change to Section XI Inservice Test Acceptance Criteria that has been approved by the ISI Program Director.

d. A change to the acceptance criteria in a Reactor Engineering surveillance test that has been approved by the Section Head.

QUESTION: 060 (1.00)

If the APRM Gain Adjustment Factor (AGAF) is 0.99 . . . [CHOOSE ONE]

a. a non-conservative condition exists

b. the APRM gain should be adjusted

c. the indicated thermal power is greater than the actual thermal power

d. the indicated power should be compared with the power determined by a heat balance

QUESTION: 061 (1.00)

The "HPCI Out of Service" annunciator is lit.

WHICH ONE (1) of the following conditions would NOT activate this alarm?

a. HPCI Inverter Power Failure

b. HPCI Auxiliary Oil Pump Motor Overload

c. Valve F066, Steam Exhaust To Suppression Pool, Not Full Open

d. Valve F004, CST Suction, Control Switch in CLOSE Position

QUESTION: 062 (1.00)

Core Spray pumps "A" and "C" on Unit 1 were started using the manual initiation pushbutton for testing purposes. Unit 2 has just experienced a transient which resulted in Unit 2 plant conditions as follows:

- Reactor water level is - 60 inches
- Reactor pressure is 350 psig
- Drywell pressure is 1.8 psig

WHICH ONE (1) of the following describes the automatic actions that occur in the Unit 2 Core Spray system?

a. Core Spray pumps "A", "B", "C", and "D" start after a 15 second time delay.

b. Core Spray pumps "A" and "C" start after a 25.5 second time delay. Core Spray pumps "B" and "D" start after a 15 second time delay.

c. Core Spray pumps "A" and "C" do not start. Core Spray pumps "B" and "D" start after a 15 second time delay.

d. Core Spray pumps "A", "B", "C", and "D" do not start automatically.

QUESTION: 063 (1.00)

Unit 1 is in Operational Condition 4. Reactor vessel water level instrumentation reads as follows:

- NARROW RANGE reads 42 inches
- WIDE RANGE reads 60 inches
- SHUTDOWN RANGE reads 36 inches
- UPSET RANGE reads 16 inches

Using Attachment A to ON-145-004, "Vessel Water Level Instrumentation Malfunction," determine WHICH ONE (1) of the following statements is correct.

a. Actual water level is 36 inches. The NARROW RANGE instrumentation is not indicating correctly.

b. Actual water level is 30 inches. The SHUTDOWN RANGE instrumentation is not indicating correctly.

c. Actual water level is 60 inches. The UPSET RANGE instrumentation is not indicating correctly.

d. Actual water level is 42 inches. The WIDE RANGE instrumentation is not indicating correctly.

QUESTION: 064 (1.00)

Unit 1 is in starting up in accordance with GO-100-002, "Plant Startup and Heatup." The reactor mode switch is in Startup/Hot Standby. All IRMs are on Range 2. SRM C is bypassed for maintenance. While withdrawing the SRMs to perform IRM/SRM overlap checks, SRM channels B and D fail downscale.

SELECT the ONE correct action statement from those listed below.

a. Restore at least 3 SRM channels to operable status within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours.

b. Verify all insertable control rods to be inserted in the core and lock the reactor mode switch in the Shutdown position within 1 hour.

c. Be in at least HOT SHUTDOWN within the next 6 hours, and be in at least COLD SHUTDOWN within the following 24 hours.

d. Continue the startup after verifying proper IRM/SRM overlap using SRM A. No Technical Specification action statements are applicable.

QUESTION: 065 (1.00)

Unit 1 is operating at 100% power. Standby Liquid Control (SLC) Pump 1P208A is inoperable. The continuity meter for SLC explosive valve A (F004A) reads 2 MA. The continuity meter for SLC explosive valve B (F004B) reads 1.5 MA.

SELECT the ONE correct action statement in accordance with Technical Specifications from those listed below.

a. Restore the system to OPERABLE status within 30 days or insert all insertable control rods within the next hour.

b. Restore the system to OPERABLE status within 7 days or insert all insertable control rods within the next hour.

c. Restore the system to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours.

d. Restore the system to OPERABLE status within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours.

QUESTION: 066 (1.00)

Unit 1 is operating at 100% power. The reactor building operator reports that the temperature of the SLC tank is 75^F and the tank level is 4900 gallons. The latest sample results indicate that the concentration of the sodium pentaborate solution in the storage tank is 13.35% by weight.

SELECT the ONE correct action from those listed below.

a. No action is required. It is not necessary to declare the Standby Control System inoperable because all reported parameters are within acceptable limits.

b. Declare the Standby Liquid Control system inoperable because the temperature of the sodium pentaborate solution is not within acceptable limits.

c. Declare the Standby Liquid Control system inoperable because the available volume of sodium pentaborate solution is not within acceptable limits.

d. Declare the Standby Liquid Control system inoperable because the concentration of the sodium pentaborate solution is not within acceptable limits.

QUESTION: 067 (1.00)

Unit 1 is operating at 100% power. Diesel Generator A is out of service for extensive maintenance and has been replaced with Diesel Generator E. The following equipment is OUT OF SERVICE:

- 480V AC load center 1B280
- 480V AC load center 1B210
- 480V AC motor control center 0B516
- 480V AC motor control center 1B227

SELECT the ONE correct action statement in accordance with Technical Specifications from those listed below.

a. Re-energize the equipment within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. Re-energize the equipment within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

c. Re-energize the equipment within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

d. Re-energize the equipment or be in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 24 hours.

QUESTION: 068 (1.00)

SELECT the proper emergency classification based on the following information:

Both units were operating at 100% power when an approaching hurricane was reported. Both units were reduced to 65% power in accordance with ON-000-002, "Natural Phenomena." The latest weather report indicates wind speeds of 90 mph.

a. Unusual Event

b. Alert

c. Site Emergency

d. General Emergency

QUESTION: 069 (1.00)

A liquid radwaste discharge is in progress. The release is necessary because of excessive plant water inventory. Reprocessing of the sample tanks is not possible due to a recent EHC leak. The Chemistry Supervisor reports that an error was made when performing the radiation monitor setpoint calculations for the release permit. The Chemistry Group's error caused the present alarm/trip setpoint to be higher than the setpoint required to ensure that the limits of 10 CFR Part 20, Appendix B are not exceeded.

SELECT the ONE appropriate action from those listed below.

a. The release may continue because the error resulted in a more conservative alarm/trip setpoint than that required by Technical Specifications.

b. The release may continue for up to 14 days, with the radiation monitor declared inoperable, because the limits of 10 CFR 20 do not apply to short term releases.

c. The release must be suspended until the alarm/trip setpoint is adjusted to the setpoint required to ensure that the limits of 10 CFR 20 are not exceeded.

d. The release must be suspended until a jumper is installed to bypass the inoperable radiation monitor in accordance with AD-QA-310, "Liquid Effluent Release," Attachment F.

QUESTION: 070 (1.00)

SELECT the proper emergency classification based on the following information:

The RCIC system was operating for a surveillance test when the "RCIC STEAM LINE LOGIC A HI DIFF PRESS" and the "RCIC STEAM LINE LOGIC B HI DIFF PRESS" annunciators came in. The RCIC system did not isolate as expected. The PCO was unable to shut the inboard and outboard isolation valves (F007 and F008) so he shut the RCIC Steam Supply Valve (F045).

a. Unusual Event

b. Alert

c. Site Emergency

d. None Applicable

QUESTION: 071 (1.00)

SELECT the proper emergency classification based on the following information:

Unit 1 was operating at 100% power when a large break LOCA occurred. Reactor water level decreased to approximately -170 inches and has not yet been restored five minutes after the event occurred. Efforts are in progress to restore reactor water level in accordance with the Emergency Operating Procedures (EOPs). The operator performing ON-159-002, "Containment Isolation," reports that the Drywell Nitrogen Makeup inboard and outboard isolation valves are stuck open.

a. Alert

b. Site Emergency

c. General Emergency

d. None Applicable

QUESTION: 072 (1.00)

SELECT the proper emergency classification based on the following information:

During refueling of Unit 1, the refuel floor SRO reports that a new fuel bundle has been dropped. The Refueling Floor Area High Radiation alarm is lit in the Control Room. The operator sent to the upper relay room reports that the area radiation monitor is reading 2000 times normal. No Process Ventilation RMS alarms have been received.

a. Unusual Event

b. Alert

c. Site Emergency

d. None Applicable

QUESTION: 073 (1.00)

It is 8:00 PM on a Saturday night. A General Emergency has just been declared due to an offsite release. The release has been terminated and the plume is expected to pass in 3 hours. The release did not contain substantial quantities of radioiodine or particulate materials. Offsite dose rates of 500 mr/hr are projected. A severe winter storm is in progress.

SELECT the appropriate action from those listed below that should be taken by the Emergency Director with respect to Protective Active Recommendations (PARs). Attachment H to EP-IP-033 is attached.

a. Recommend SHELTERING for people within 10 mile radius.

b. Recommend EVACUATION of people within 2 mile radius and SHELTERING of people from 2 mile to 10 mile radius.

c. Recommend EVACUATION of people within 10 mile radius.

d. Protective Action Recommendations are the responsibility of the Recovery Manager. NO recommendations should be made until the Emergency Director is relieved by the Recovery Manager.

QUESTION: 074 (1.00)

Unit 1 was operating at 90% power when the reactor operator notices decreasing feedwater temperature and increasing reactor power.

WHICH ONE (1) of the following actions should be performed immediately?

a. Runback recirc flow to reduce thermal power to 70%.

b. Insert rods to below the 80% rod line.

c. Enter ON-178-002, "Core Flux Oscillations."

d. Reduce thermal power back to 90% with recirc or rods.

QUESTION: 075 (1.00)

A common mode failure causes a loss of all 125 VDC busses.

WHICH ONE (1) of the following functions is NOT disabled due to the loss of 125 VDC?

a. Reactor Feed Pump trip

b. Safety Relief Valve ADS function

c. Safety Parameter Display System

d. HPCI automatic initiation

QUESTION: 076 (1.00)

Using the attached Heat Capacity Temperature Limit (HCTL) and Heat Capacity Level Limit (HCLL) curves from EO-100-103, "Primary Containment Control," SELECT the set of parameters for which rapid RPV depressurization is NOT required. No boron has been injected.

a. Reactor Pressure: 850 psig
Suppression Pool Temperature: 180 degrees F
Suppression Pool Level: 23.5 feet

b. Reactor Pressure: 650 psig
Suppression Pool Temperature: 175 degrees F
Suppression Pool Level: 20.5 feet

c. Reactor Pressure: 550 psig
Suppression Pool Temperature: 170 degrees F
Suppression Pool Level: 20.0 feet

d. Reactor Pressure: 450 psig
Suppression Pool Temperature: 165 degrees F
Suppression Pool Level: 14.5 feet

QUESTION: 077 (1.00)

EO-104, "Secondary Containment Control," requires a rapid depressurization of the RPV if more than one area temperature exceeds the "Max Safe" value.

WHICH ONE (1) of the following statements does NOT correctly describe the basis for this step?

a. Beyond maximum safe operating temperature, continued operation of safety related systems is no longer assured.

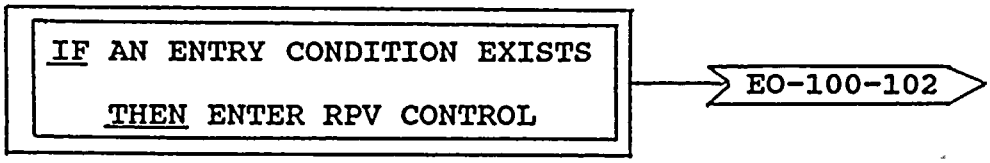
b. Beyond maximum safe operating temperature, continued integrity of secondary containment is no longer assured.

c. RPV depressurization reduces the driving head and flow of primary systems that are discharging into primary containment.

d. RPV depressurization must be performed while SRVs and/or bypass valves are still operable.

QUESTION: 078 (1.00)

EO-100-101, "Scram," step S-5 is shown below as it appears on the EOP flowchart.



WHICH ONE (1) of the following statements is NOT correct concerning performance of this step?

a. The step becomes effective as when read and remains effective until the EO-100-101 flowchart is exited.

b. The actions specified in steps S-1 through S-4 (mode switch to S/D, ensure scram, insert SRMs and IRMs, ensure automatic actions) must be completed or in progress prior to exiting EO-100-101.

c. The actions specified in steps S-6 through S-8 (trip main turbine, observe automatic actions, verify turbine speed decreasing) should be done concurrently with entering EO-100-102.

d. The step alerts the operators to check the parameters that are entry conditions for EO-100-102 frequently.

QUESTION: 079 (1.00)

EO-100-102, "RPV Control," requires concurrent execution of sections RC/Q (Reactor Power Control), RC/L (Reactor Level Control), and RC/P (Reactor Pressure Control).

WHICH ONE (1) of the following describes the bases for concurrent execution?

a. The parameters are interrelated.

b. Each parameter is equally important to plant safety.

c. RPV protection requires that these three parameters be controlled.

d. Concurrent execution ensures that high priority steps are not overlooked.

QUESTION: 080 (1.00)

Unit 1 experienced a reactor scram on low RPV level due to the loss of all the Reactor Feedwater pumps (RFPs). EO-101, "Scram" and EO-102, "RPV Control" were entered. The "A" RFP was restarted and the level decrease was stopped at -50 inches. When level was at +10 inches and increasing, an operator error caused the "A" RFP to trip. Level rapidly decreased and is now at -45 inches.

SELECT the correct statement regarding use of the EOPs in this situation from the choices below.

a. The SRO should continue to step through EO-102, attempting to restore level with other available systems.

b. The SRO should exit EO-102 and enter EO-111, "Level Restoration."

c. The SRO should exit EO-102 and enter EO-114, "RPV Flooding."

d. The SRO should re-enter EO-102 at the beginning.

QUESTION: 081 (1.00)

The final step of EO-100-102, "RPV Control," directs the operator to enter EO-100-101, "Scram," when the reactor is shutdown, RPV level is stabilized greater than -38", and RPV pressure is "under control".

WHICH ONE (1) of the following situations does NOT meet the definition of reactor pressure "under control?"

a. RPV pressure stable with the operator controlling pressure by manual operation of the SRVs.

b. A controlled depressurization in progress using the SRVs.

c. RPV pressure stable with the bypass valves controlling pressure automatically.

d. RPV depressurized to atmospheric pressure and vented.

QUESTION: 082 (1.00)

WHICH ONE (1) of the following statements is correct concerning the Minimum Alternate RPV Flooding Pressure table used in step LQ-13 of EO-100-113, "Level/Power Control?"

a. Once RPV pressure decreases below the Minimum Alternate RPV Flooding Pressure, adequate core cooling is assured.

b. Once RPV pressure decreases below the Minimum Alternate RPV Flooding Pressure, steam flow through the core does not provide adequate core cooling.

c. If there are no SRVs open and pressure remains above the Minimum Alternate RPV Flooding Pressure, sufficient natural circulation flow through the core exists to provide adequate core cooling.

d. If at least 2 SRVs are open and pressure remains above the Minimum Alternate RPV Flooding Pressure, insufficient natural circulation exists to provide adequate core cooling and injection must be reestablished to increase RPV level.

QUESTION: 083 (1.00)

EO-100-103, "Primary Containment Control," states that the containment shall be vented irrespective of Off-Site release when specified conditions have been met.

WHICH ONE (1) of the following sets of conditions would require containment venting?

a. Drywell and Suppression Chamber pressures reach 60 psia.

b. Drywell or Suppression Chamber pressure cannot be maintained less than 60 psia.

c. Drywell or Suppression Chamber pressure reaches 68 psia.

d. Drywell and Suppression Chamber pressure cannot be maintained below 68 psia.

QUESTION: 084 (3.00)

EO-100-103, "Primary Containment Control," has been entered due to high drywell pressure and temperature. Plant conditions are as follows:

RPV Pressure:	600 psig
RPV Level:	-140 in
Drywell Temperature:	275^F
Drywell Pressure:	55 psia
Supp. Chamber Pressure:	39 psig
Supp. Chamber Temp:	230^F
Supp. Pool Temperature:	160^F
Supp. Pool Level:	39.0 ft

Assume all automatic actions occurred as expected and all equipment was operating in normal configuration for 100% power before the event occurred. No operator actions have been performed.

SELECT all the actions from those listed below that should be performed in accordance with the PC/P and DW/T legs of EO-100-103 (attached). If none of the actions should be performed, state NONE.

1. Bypass DW Cooling Logic Isolations IAW ES-134-001
2. Operate SGTS IAW ON-134-001
3. Secure Drywell Coolers
4. Rapidly Depressurize RPV IAW EO-112
5. Flood RPV IAW EO-114
6. Initiate Suppression Pool Sprays
7. Initiate Drywell Sprays
8. Secure Reactor Recirculation Pumps
9. Vent Suppression Chamber IAW ON-134-001
10. Vent Drywell IAW ON-134-001

QUESTION: 085 (3.00)

A Refuel Floor Exhaust High High Radiation alarm and Control Room Emergency Outside Air Intake High High Radiation alarm have been received in the Control Room.

For EACH area listed in Column A, SELECT the item from Column B that describes the ventilation exhaust path for the area. The items in Column B may be used once, more than once or not at all.

COLUMN A (AREAS)		COLUMN B (EXHAUST PATHS)	
a.	Battery Rooms	1.	Release via Reactor Building Vent
b.	Control Room	2.	Release via Turbine Building Vent
c.	Railroad Access	3.	Release via SGTS Vent
d.	Access Control Area	4.	Recirc through CREOASS
e.	Decontamination Area (Chem Lab)	5.	System Isolated and/or Fan(s) Tripped
f.	SGTS Equipment Room		

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

ANSWER: 001 (1.00)

c.

REFERENCE:

1. AD-QA-103 page 24.

2. Shift Supervison Task #02004: Review Tagging requests for plant equipment

K/A 294001 K1.02 (3.9/4.5)

294001K102 ..(KA's)

ANSWER: 002 (1.00)

b.

REFERENCE:

1. AD-QA-103, Protective Permit and Tag System, pg 11

2. AD-QA-302, System Status and Equipment Control, pg 8

3. AD044: Administrative Procedures and Operations Instructions - Specific Objective XV.B.2.f

K/A 294001 K1.02 (3.9/4.5)

294001K102 ..(KA's)

ANSWER: 003 (2.50)

*ANSWER

a. 3 d. 7
b. 3 e. 5
c. 2 (0.5 each)

REFERENCE:

*REFERENCE
1. Conduct of Operation (AD-QA-300), page 47.

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective VII.B.2.d

K/A 294001 K1.01 (3.7/3.7)
294001K101 ..(KA's)

ANSWER: 004 (2.00)

a. 4160 VAC and above.

b. 1. Equipment check (in accordance with applicable procedures). (0.5)

2. General area inspection (to ensure no personnel safety hazards exist). (0.5)

3. Notification of other Unit control room of the evolution to be performed. (0.5)

REFERENCE:

1. Conduct of Operations, AD-QA-300 page 55.

2. Shift Supervison Task #01014: Direct shift personnel actions during major plant evolutions

3. AD044: Administrative Procedures and Operations Instructions - Specific Objective VII.B.3.d

K/A 294001 K1.07 (3.3/3.6)

294001K107 ..(KA's)

ANSWER: 005 (1.00)

b.

REFERENCE:

1. Fire Watch Procedure (AD-QA-143) page 8.

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective XXI.B.6

K/A 294001 K1.16 (3.5/3.8)

294001K116 ..(KA's)

ANSWER: 006 (1.00)

c.

REFERENCE:

1. Hydrogen Storage System, OP-074-001.

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective XXII.B.1 (AD-QA-140, Use and Storage of Combustible/Hazardous Materials, not supplied to NRC)

K/A 294001 K1.15 (3.4/3.8)

294001K115 ..(KA's)

ANSWER: 007 (1.00)

*ANSWER

d.

REFERENCE:

*REFERENCE

1. AD-00-705, Access Control and Radiation Work Permit System, pg 16

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective VI.B.4

K/A 294001 K1.03 (3.3/3.8)

294001K103 ..(KA's)

ANSWER: 008 (1.00)

*ANSWER

c.

REFERENCE:

*REFERENCE
1. ON-178-002, Core Flux Oscillations, pg 2

2. ON-164-002, Loss of Reactor Recirculation Flow, pg 3

3. GO-100-009, Single Recirculation Loop Operation, Attachment A

4. AD045: Off-Normal Procedures - Terminal Unit Objective

K/As 295001 A2.01 (3.8) 295001 SG.10 (3.7)
295001 SG.11 (4.2)

295001A201 295001G010 295001G011 ..(KA's)

ANSWER: 009 (1.00)

d.

REFERENCE:

1. ON-178-002, Core Flux Oscillations, pgs 4 and 5

2. AD045: Off-Normal Procedures - Specific Objective 1

K/As 295001 K1.03 (4.1) 295001 K1.02 (3.5)
295001 SG.04 (3.7)

295001G004 295001K102 295001K103 ..(KA's)

ANSWER: 010 (1.00)

b.

REFERENCE:

1. SY017 A-5: Licensed Operator System Generator Stator Cooling (Level III), pg 4 - Specific Objective 3

2. ON-197-001, Loss of Stator Cooling, pg 3

K/As 295005 SG.5 (3.6) 295005 SG.11 (4.1)
295018 SG.5 (3.5) 295018 SG.11 (4.1)

295005G005 295005G011 295018G005 295018G011 ..(KA's)

ANSWER: 011 (1.00)

c.

REFERENCE:

1. SY017 M-1: Emergency Service Water - Terminal Unit Objective

2. ON-054-001, Loss of Emergency Service Water, pg 5

3. OP-054-001, Emergency Service Water System, pg 5

K/As 295018 K2.02 (3.6) 295018 SG.04 (3.5)

295018G004 295018K202 ..(KA's)

ANSWER: 012 (1.00)

d.

REFERENCE:

1. ON-155-007, Loss of CRD System Flow, page 2.

K/As 295022 SG.10 (3.5)

295022G010 ..(KA's)

ANSWER: 013 (1.00)

a.

REFERENCE:

1. ON-118-001, Loss of Instrument Air, pg 4
2. AD045: Off-Normal Procedures - Specific Objective 3

K/As 295019 K2.01 (3.9) 295019 SG.04 (3.6)

295019G004 295019K201 ..(KA's)

ANSWER: 014 (1.00)

b.

REFERENCE:

1. SSES Technical Specifications, page B 3/4 9-2

K/As 295023 K1.01 (3.6/4.1) 295023 SG.04 (2.7/3.8)

295023G004 295023K101 ..(KA's)

ANSWER: 015 (1.00)

d.

REFERENCE:

1. ON-149-001, Loss of RHR Shutdown Cooling Mode, pgs 3 and 4
2. Shift Supervision Task #04010: Direct actions to ensure that core cooling and the Shutdown Margin are maintained during an abnormal or emergency event.

K/As 295021 A1.04 (3.7) 295021 SG.10 (3.3)

295021A104 295021G010 ..(KA's)

ANSWER: 016 (1.00)

d.

REFERENCE:

1. EO-100-030, Unit 1 Response to Station Blackout, pages 4 and 5.
2. SM001C: Event Based EOPs - Specific Objective 2.c

K/As 295003 K1.06 (3.8/4.0) 295003 A1.03 (4.4/4.4)

295003A103 295003K106 ..(KA's)

ANSWER: 017 (1.00)

a.

REFERENCE:

1. EO-100-009, Plant Shutdown from Outside the Control Room, page 2.
2. SM001C: Event Based EOPs - Specific Objective 1.e

K/As 295016 SG.10 (3.8/3.6)

295016G010 ..(KA's)

ANSWER: 018 (1.00)

b.

REFERENCE:

1. EO-100-009, Plant Shutdown from Outside the Control Room, pages 3, 40, 41.

2. SM001C: Event Based EOPs - Specific Objective 1.a

K/As 295016 K3.03 (3.5/3.7)

295016K303 ..(KA's)

ANSWER: 019 (2.00)

a. 2
b. 6
c. 5
d. 4 (0.5 each)

REFERENCE:

1. ON-143-001, Loss of Main Condenser Vacuum, page 2

2. SY017 A-1: Main Trubine Construction - Specific Objective 17

K/As 295002 K2.02 (3.1/3.2) 295002 K2.03 (3.5/3.6)
295002 K2.04 (3.2/3.3)

295002K202 295002K203 295002K204 ..(KA's)

ANSWER: 020 (1.00)

d.

REFERENCE:

1. EO-100-101, Scram Bases, pg 7

2. PP002A: Emergency Operating Procedures - Specific Objective 19

K/As 295005 K2.08 (3.3) 295005 SG.07 (3.3)

295005G007 295005K208 ..(KA's)

ANSWER: 021 (2.00)

1. Scram the reactor (~~0.5~~ 1.0) TW
2. (Runback Recirc or Reduce Recirc speed to minimum) ~~(0.5)~~ TW
3. (Trip both Recirc pumps) ~~(0.5)~~ TW
4. Isolate the MSIVs and MSL drains (~~0.5~~ 1.0) TW
   (Inject SLC before suppression pool temperature > 110^F)

OR

1. AND 4. AS COLLECT ANSWER

REFERENCE:

1. AD-QA-300, Attachment D, Immediate Operator Actions

2. PP002A: Emergency Operating Procedures - Specific Objective 23

K/As 295037 SG.10 (3.8) 295037 SG.11 (4.7)
295006 SG.10 (4.2) 295006 SG.11 (4.5)

295006G010 295006G011 295037G010 295037G011 ..(KA's)

ANSWER: 022 (1.00)

b.

REFERENCE:

1. EO-100-100, Caution and Note Bases, pg 5

2. PP002A: Emergency Operating Procedures - Specific Objective 2

K/As 295026 SG.07 (3.4/3.8)

295026G007 ..(KA's)

ANSWER: 023 (1.00)

*ANSWER

d.

REFERENCE:

*REFERENCE
1. EO-100-112, Rapid Depressurization Bases, pg 4

2. PP002A: Emergency Operating Procedures - Specific Objective 5.b

K/As 295030 K2.08 (3.8)
295030K208 ..(KA's)

ANSWER: 024 (1.00)

c.

REFERENCE:

1. EO-100-103, Primary Containment Control, pg 17

2. PP002A: Emergency Operating Procedures - Specific Objective 19

K/As 295024 K2.18 (3.4) 295024 SG.04 (4.1)

295024G004 295024K218 ..(KA's)

ANSWER: 025 ~~(1.00)~~ deleted due to family comment

c.

REFERENCE:

1. EO-100-104, Secondary Containment Control, flowchart

2. PP002A: Emergency Operating Procedures - Specific Objective 14

K/As 295033 SG.11 (4.5) 295033 SG.12 (4.4)

295033G011 ..(KA's)

ANSWER: 026 (1.00)

c.

REFERENCE:

SY017 A-8 pages 1 - 24.
SY017 A-8 Learning Objective 8.b
K/As 241000 K3.01 (4.1/4.1) 241000 K3.02 (4.2/4.3)
241000 K3.06 (4.1/4.1)

241000K301 241000K302 241000K306 ..(KA's)

ANSWER: 027 (3.00)

*ANSWER
a. 3, 4, 5, 6 (0.125 each)
b. 7 (NONE) (0.5)
c. 2, 3, 5 (0.167 each)
d. 1 (0.5)
e. 1, 4 (0.25 each)
f. 7 (NONE) (0.5)

REFERENCE:

*REFERENCE
1. SY017 E-3: Primary Containment Isolation, Table 1 - Specific Objective 5

K/As 223002 K1.01 (3.9) 223002 K1.08 (3.5) 223002 K1.06 (3.2)
223002 K1.10 (3.2) 223002 A1.02 (3.7)
223002K101 223002K106 223002K108 223002K110 ..(KA's)

ANSWER: 028 (1.00)

*ANSWER

b.

REFERENCE:

*REFERENCE
SY017 Learning Objective #6.
SY017 G-1, page 29-30.
K/A 264000 K4.02 (4.0/4.2)
264000K402 ..(KA's)

ANSWER: 029 (1.00)

a.

REFERENCE:

SY017 K-2 Learning Objective 10.f
SY017 K-2, page 28.
K/A 201001 K6.03 (3.0/2.9) 295019 K2.01 (3.8/3.9)

201001K603 295019K201 ..(KA's)

ANSWER: 030 (1.00)

*ANSWER

d. or c.

REFERENCE:

*REFERENCE
SY017 K-2, 10.c
SY017 K-2 page 21.
K/A 212000 K6.04 (2.8/3.1)
295004 K2.03 (3.3/3.3)
212000K604 295004K203 ..(KA's)

ANSWER: 031 (1.00)

d.

REFERENCE:

SY017 pages 11 and 15.
K/A 239002 A1.01 (3.3/3.4)

218000A101 239002A101 ..(KA's)

ANSWER: 032 (1.00)

a.

REFERENCE:

1. SYO10 C-4:Automatic Depressurization System, pages 7 and 13 - Specific Objective 9d

K/As 218000 A2.06 (4.2/4.3) 218000 A4.03 (4.2/4.2)

218000A206 218000A403 ..(KA's)

ANSWER: 033 (1.00)

*ANSWER

b.

REFERENCE:

*REFERENCE
OP-150-001 Revision 9, page 9.
SY017 C-5 Learning Objective 10.
K/A 217000 K5.06 (2.7/2.7) 217000 K4.04 (3.0/3.1)
217000K404 217000K506 ..(KA's)

ANSWER: 034 (1.00)

b.

REFERENCE:

1. SOER 82-8, Auxiliary Feedwater Pump Turbine Trip and Throttle Valve Indication

2. SY017 C-5: Reactor Core Isolation Cooling System, Events pg 2 - Specific Objective 11

K/As 217000 A4.02 (3.9/3.9)

217000A402 ..(KA's)

ANSWER: 035 (1.00)

b.

REFERENCE:

SY017 D-3 Learning Objective #7.
SY017 D-3 page 40.
K/As 202001 K1.19 (3.2/3.2) 202001 K1.22 (3.5/3.6)
202001 K4.02 (3.1/3.2) 202002 K6.05 (3.1/3.1)
202002 K1.08 (3.1/3.2) 202002 K4.06 (3.1/3.1)

202001K119 202001K122 202001K402 202002K605 ..(KA's)

ANSWER: 036 (1.00)

c.

REFERENCE:

SY017 L-8 page 41.
SY017 Learning Objective, (not covered).
K/As 202001 A1.02 (3.4/3.4) 202001 A1.03 (3.6/3.6)
202001 A4.04 (3.7/3.7)

202001A102 202001A103 202001A404 ..(KA's)

ANSWER: 037 (1.00)

c.

REFERENCE:

SY017 L-8 page 8.
SY017 Learning Objectives #9.
K/As 202001 A1.09 (3.3/3.3) 202001 A4.11 (3.2/3.3)

202001A109 202001A411 ..(KA's)

ANSWER: 038 (1.00)

d.

REFERENCE:

SY017 D-3 page 41
GO-100-002 Revision 11, page 24.
SY017 D-3 Learning Objective 8.b
K/As 259001 K3.01 (3.9/3.9) 259001 K6.01 (3.0/3.0)

259001K301 259001K601 ..(KA's)

ANSWER: 039 (1.00)

d.

REFERENCE:

SY017 D-3 pages 30-32, 39.
SY017 D-3 Learning Objective 8.c
K/As 259002 K6.03 (3.1/3.1) 259002 K3.01 (3.8/3.8)

259002K301 259002K603 ..(KA's)

ANSWER: 040 (1.00)

c.

REFERENCE:

SY017 I-2 page 17.
SY017 I-2 Learning Objective #3.
K/As 215003 K4.01 (3.7/3.7) 215003 K4.02 (4.0/4.0)

215003K401 215003K402 ..(KA's)

ANSWER: 041 (1.00)

b.

REFERENCE:

SY017 I-4 page 19.
AR-103-001 page 15.
SY017 I-4 Learning Objectives #2.
K/As 215005 K4.01 (3.7/3.7) 215005 K4.02 (4.1/4.2)
215005 SG.08 (3.6/3.6)

215005G008 215005K401 215005K402 ..(KA's)

ANSWER: 042 (1.00)

c.

REFERENCE:

SY017 I-4 page 13.
SY017 I-4 Learning Objective #6.
K/As 215005 K1.04 (3.6/3.6) 215005 A4.03 (3.2/3.3)

215005A403 215005K104 ..(KA's)

ANSWER: 043 (1.00)

c.

REFERENCE:

1. SY017 I-5: Traversing In-Core Probe System, page 21 - Specific Objective 5

K/As 215001 K4.01 (3.4/3.5) 215001 A2.01 (2.7/2.9)

215001A201 215001K401 ..(KA's)

ANSWER: 044 (1.00)

b.

REFERENCE:

1. SYO17 J-1: Reactor Vessel and Internals, pages 20, 24 and 25 - Specific Objective 5

K/As 290002 K4.03 (3.2/3.3)

290002K403 ..(KA's)

ANSWER: 045 (1.00)

*ANSWER

d.

REFERENCE:

*REFERENCE
1. SY017 D-1: Condensate and Condensate Demineralizers, page 19 - Specific Objective 4

K/As 256000 K4.01 (3.4/3.4) 256000 A2.10 (3.1/3.1)
256000A210 256000K401 ..(KA's)

ANSWER: 046 (1.00)

c.

REFERENCE:

1. SY017 F-2: Off Gas Recombiner, pages 10 and 11 - Specific Objective 6.b

K/As 271000 A1.08 (3.1/3.1) 271000 K4.08 (3.1/3.3)
271000 A4.06 (3.3/3.2) 271000 A4.09 (3.3/3.2)

271000A108 271000A406 271000A409 271000K408 ..(KA's)

ANSWER: 047 (1.00)

b.

REFERENCE:

SY017 K-6 page 8.
SY017 K-6 Learning Objective #9.
K/As 201006 A1.02 (3.4/3.6) 201006 K5.10 (3.2/3.3)

201006A102 201006K510 ..(KA's)

ANSWER: 048 (1.00)

a.

REFERENCE:

SY017 K-6 page 17.
SY017 K-6 Learning Objectives #8 & #9.
K/As 201006 A1.01 (3.2/3.3) 201006 A1.02 (3.4/3.5)

201006A101 201006A102 ..(KA's)

ANSWER: 049 (1.00)

c.

REFERENCE:

SY017 Learning Objective #3.
SY017 I-1 page 29.
K/A 215004 K4.01 (3.7/3.7)

215004K401 ..(KA's)

ANSWER: 050 (1.00)

c.

REFERENCE:

1. RE-081-032, Refueling Operations, page 7

K/As 234000 A4.01 (3.7/3.9)
215004 A4.07 (3.4/3.6)

215004A407 234000A401 ..(KA's)

ANSWER: 051 (1.00)

c.

REFERENCE:

1. SY017 M-2: Fuel Handling Systems, pages 19 and 20 - Specific Objective 12.a

K/As 234000 K5.02 (3.1/3.7)

234000K502 ..(KA's)

ANSWER: 052 (1.00)

*ANSWER

a.

REFERENCE:

*REFERENCE
1. SY017 E-2: Secondary Containment, pages 10 and 11 - Specific Objectives 6 and 8

2. SY017 L-3: Standby Gas Treatment System, pages 11 and 27 - Specific Objective 5

K/As 261000 K4.01 (3.7/3.8) 261000 A2.10 (3.1/3.2)
290001 A3.01 (3.9/4.0)
261000A210 261000K401 290001A301 ..(KA's)

ANSWER: 053 (1.00)

c.

REFERENCE:

SY017 C-1 page 2 and 3 (Attachment D)
SY017 C-1 Learning Objective #8.
K/As 205000 K4.04 (2.6/2.6) 205000 K6.04 (3.6/3.6)

205000K404 205000K604 ..(KA's)

ANSWER: 054 (1.00)

a.

REFERENCE:

1. SY017 C-1: Residual Heat Removal, Attachment D, page 2 and Event 1, page 2 - Specific Learning Objectives 9 and 16.

2. OP-149-002, RHR Operation in Shutdown Cooling Mode, page 7

K/As 205000 K4.03 (3.8/3.8) 205000 SG.10 (3.2/3.3)

205000G010 205000K403 ..(KA's)

ANSWER: 055 (1.00)

b.

REFERENCE:

1. SY017 C-1: Residual Heat Removal, page 6 of Attachment A, page 2 of Attachment B, Pages 1 and 2 of Attachment C - Specific Objectives 5, 8, and 9

2. OP-149-001, RHR System, page 11

3. OP-149-005, RHR Operation in Suppression Pool Cooling Mode, page 7

K/As 219000 A2.14 (4.1/4.3) 219000 K4.03 (3.8/3.8)
219000 A1.08 (3.7/3.6) 203000 K4.10 (3.9/4.1)
203000 A3.01 (3.8/3.7)

203000K410 219000A108 219000A214 219000K403 ..(KA's)

ANSWER: 056 (3.00)

*ANSWER
a. 2 (0.5)
b. 3 (0.5)
c. 1, 2 (0.25 each)
d. 5 (0.5)
e. 3 (0.5)
f. 4 (0.5)

REFERENCE:

*REFERENCE
1. PP002A: Emergency Operating Procedures - Specific Objective 17

K/As 295026 SG.11 (4.6) 295032 SG.11 (4.2)
295024 SG.11 (4.5) 295034 SG.11 (4.3)
295038 SG.11 (4.5)
295024G011 295026G011 295032G011 295034G011 ..(KA's)

ANSWER: 057 (2.50)

a. 2
b. 2
c. 1
d. 3
e. 1
(0.50 each)

REFERENCE:

*REFERENCE
1. AD-00-705, Access Control and Radiation Work Permit System

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective VI.B.2

K/A 294001 K1.03 (3.3/3.8)
294001K103 ..(KA's)

ANSWER: 058 (2.00)

a. 1
b. 4
c. 2
d. 3 or 4 (0.50 each)

REFERENCE:

1. AD-QA-300, Conduct of Operations, pgs 43 - 45

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective VII.B.7

K/A 294001 K1.01 (3.7/3.7)

294001K101 ..(KA's)

ANSWER: 059 (1.00)

c.

REFERENCE:

1. AD-QA-000, Procedure Changes, pg 12

2. AD044: Administrative Procedures and Operations Instructions - Specific Objectives V.B.2.a, b and d

K/A 294001 A1.01 (2.9/3.4)

294001A101 ..(KA's)

ANSWER: 060 (1.00)

c.

REFERENCE:

1. SY017 I-4: Average Power Range Monitors, pg 22 - Specific Objective 6

K/As 215005 A1.07 (3.4/3.4)

215005A107 ..(KA's)

ANSWER: 061 (1.00)

d.

REFERENCE:

1. SY017 C-6: High Pressure Coolant Injection System, page 22 - Specific Objective 5.e

K/As 206000 SG.08 (4.3/4.1)

206000G008 ..(KA's)

ANSWER: 062 (1.00)

c.

REFERENCE:

1. SY017 C-2: Core Spray, pages 17, 18, 19 and 33 - Specific Objectives 3 and 6

K/As 209001 K4.08 (3.8/4.0) 209001 K4.09 (3.3/3.5)
209001K408 209001K409 ..(KA's)

ANSWER: 063 (1.00)

*ANSWER

b.

REFERENCE:

*REFERENCE
1. SY017 J-2: Reactor Vessel Instrumentation - Specific Objective 3

2. ON-145-004, Vessel Water Level Instrumentation Malfunction, Attachment A

K/As 216000 K3.24 (3.9/4.1) 216000 A2.11 (3.2/3.3)
216000 A4.01 (3.3/3.1)
216000A211 216000A401 216000K324 ..(KA's)

ANSWER: 064 (1.00)

c.

REFERENCE:

1. SY017 I-1: Source Range Monitor (Level III), pg 32 and Figure 2

2. Unit 1 Technical Specifications, sections 3.0.3 and 3.3.7.6

3. Unit 1 Technical Specification Interpretation Number 1-89-002

4. GO-100-002, Plant Startup and Heatup, pg 19

5. Shift Supervison Task #01017: Ensure plant operates in accordance with the Operating License and Tech Specs

K/As 215004 A2.02 (3.7) 215004 SG.5 (3.9)
215004 SG.11 (3.9)

215004A202 215004G005 215004G011 ..(KA's)

ANSWER: 065 (1.00)

d.

REFERENCE:

1. SY017 C-3: Licensed Operator System Standby Liquid Control (Level III), pg 5
2. Unit 1 Technical Specifications, section 3.1.5
3. Shift Supervision Task #01017: Ensure plant operates in accordance with the Operating License and Tech Specs

K/As 211000 K4.04 (3.9) 211000 SG.5 (4.4)
211000 SG.11 (4.1)

211000G005 211000G011 211000K404 ..(KA's)

ANSWER: 066 (1.00)

a.

REFERENCE:

1. SY017 C-3: Licensed Operator System Standby Liquid Control (Level III), pgs 4, 5, and 15, Figures 3 and 4
2. Unit 1 Technical Specifications, section 4.1.5
3. Shift Supervision Task #01010: Review Operating Logs for trends and out-of-specification conditions
4. Shift Supervision Task #01017: Ensure plant operates in accordance with the Operating License and Tech Specs

K/As 294001 A1.08 (3.6) 211000 K4.03 (3.9)
211000 SG.5 (4.4) 211000 SG.11 (4.1)

211000G005 211000G011 211000K403 294001A108 ..(KA's)

ANSWER: 067 (1.00)

d.

REFERENCE:

1. Unit 1 Technical Specifications, sections 3.8.1 and 3.0.3

2. SY017 M-3: Technical Specifications - Specific Objective 6

K/As 295003 SG.03 (3.2/4.1) 295003 K2.03 (3.7/3.9)
262001 SG.05 (2.9/3.9)

262001G005 295003G003 295003K203 ..(KA's)

ANSWER: 068 (1.00)

c.

REFERENCE:

1. EP-IP-001, Emergency Classification, pg 28

2. Shift Supervision Task #04015: Analyze indications to determine that an Emergency Plan Event is in progress

K/As 294001 A1.16 (4.7)

294001A116 ..(KA's)

ANSWER: 069 (1.00)

c.

REFERENCE:

1. SY017 B-2: Process Radiation Monitoring System, pg 6 - Specific Objective 7
2. Unit 1 Technical Specifications, sections 3.3.7.10 and 3.11.1.1
3. Unit 1 Technical Specification Interpretation Number 1-86-005
4. AD-QA-310, Liquid Effluent Release
5. Shift Supervision Task #01027: Witness Radioactive Releases

K/As 268000 SG.5 (3.2) 268000 SG.6 (3:1)
268000 SG.11 (3.6) 272000 SG.5 (3.9)
27200 SG.11 (4.2)

268000G005 268000G006 268000G011 272000G005 ..(KA's)

ANSWER: 070 (1.00)

c.

REFERENCE:

1. EP-IP-001, Emergency Classification, pg 39
2. Shift Supervision Task #04015: Analyze indications to determine that an Emergency Plan Event is in progress

K/As 294001 A1.16 (4.7) 295032 SG.02 (4.4)

294001A116 295032G002 ..(KA's)

ANSWER: 071 (1.00)

c.

REFERENCE:

1. EP-IP-001, Emergency Classification, pg 26

2. Shift Supervision Task #04015: Analyze indications to determine that an Emergency Plan Event is in progress

K/As 294001 A1.16 (4.7) 295031 SG.2 (4.6)

294001A116 295031G002 ..(KA's)

ANSWER: 072 (1.00)

c.

REFERENCE:

1. EP-IP-001, Emergency Classification, pg 37

2. Shift Supervision Task #04015: Analyze indications to determine that an Emergency Plan Event is in progress

K/As 294001 A1.16 (4.7) 295023 SG.02 (4.5)

294001A116 295023G002 ..(KA's)

ANSWER: 073 (1.00)

a.

REFERENCE:

1. EP-IP-033, Dose Assessment and Protective Actions, pgs 4 and 9 and Attachment H

2. Shift Supervison Task #04021: Direct emergency response as Site Emergency Director

K/As 294001 A1.16 (4.7)

294001A116 ..(KA's)

ANSWER: 074 (1.00)

a.

REFERENCE:

1. ON-147-001, Loss of Feedwater Heating (Extraction Steam), page 2

2. ON-147-002, Loss of Feedwater Heater String, page 3

3. ON-156-001, Unexplained Reactivity Change, page 3

K/As 295014 A1.07 (4.0/4.1) 295014 A2.03 (4.1/4.3)
295014 K2.06 (3.4/3.5) 295014 SG.10 (4.0/3.9)

295014A107 295014A203 295014G010 295014K206 ..(KA's)

ANSWER: 075 (1.00)

c.

REFERENCE:

1. SY017 G-3: DC Distribution 125 VDC - Specific Objective 5

2. ON-102-001, Loss of 125V DC Bus

3. PP002A: Emergency Operating Procedures - Specific Objective 21

K/As 295004 K2.03 (3.3/3.3) 263000 K2.01 (3.1/3.4)
263000 K3.02 (3.5/3.8) 263000 K3.03 (3.4/3.8)

263000K201 263000K302 263000K303 295004K203 ..(KA's)

ANSWER: 076 (1.00)

c.

REFERENCE:

1. EO-100-103, Primary Containment Control, pgs 6, 7 and 10 and Figures PC-1 and PC-2

2. PP002A: Emergency Operating Procedures - Specific Objective 3.c

K/As 295026 A2.01 (4.2) 295026 A2.02 (3.9)
295026 A2.03 (4.0) 295026 SG.12 (4.5)
295030 A2.01 (4.2) 295030 A2.02 (3.9)
295030 A2.03 (3.9) 295030 SG.12 (4.4)
294001 A1.08 (3.6)

295026A201 295026A202 295026A203 295026G012 ..(KA's)

ANSWER: 077 (1.00)

d. or c.

REFERENCE:

1. EO-100-104, Secondary Containment Control, pg 9
2. PP002A: Emergency Operating Procedures - Specific Objective 19

K/As 295032 K3.01 (3.8)

295032K301 ..(KA's)

ANSWER: 078 (1.00)

c.

REFERENCE:

1. EO-100-101, Scram Bases, page 4
2. PP002A: Emergency Operating Procedures, Attachment E - Specific Objectives 10 and 19

K/As 295006 SG.12 (3.8/4.4)

295006G012 ..(KA's)

ANSWER: 079 (1.00)

a.

REFERENCE:

1. EO-100-102, "RPV Control," page 4
2. PP002A: Emergency Operating Procedures - Specific Objective 19

K/As 295025 K2.09 (3.9/3.9) 295025 K2.11 (3.5/3.6)
295031 K1.03 (3.7/4.1) 295031 K2.02 (3.8/3.9)

295025K209 295025K211 295031K103 295031K202 ..(KA's)

ANSWER: 080 (1.00)

d.

REFERENCE:

1. EO-100-102, RPV Control, flowchart

2. PP002A: Emergency Operating Procedures - Specific Objectives 14 and 15

K/As 295031 SG.11 (4.6) 295031 SG.12 (4.5)

295031G011 295031G012 ..(KA's)

ANSWER: 081 (1.00)

a.

REFERENCE:

1. EO-100-102, RPV Control, pg 25

2. PP002A: Emergency Operating Procedures - Specific Objectives 14 and 18

K/As 295025 A1.02 (3.8) 295025 A1.03 (4.4)
295025 SG.12 (4.5)

295025A102 295025A103 295025G012 ..(KA's)

ANSWER: 082 (1.00)

b.

REFERENCE:

1. EO-100-113, Level/Power Control Bases, pg 10

2. SC006L: Review of Systems and Procedures Used for Mitigating Accidents, pgs 26 and 27 - Specific Objective 3

3. PP002A: Emergency Operating Procedures - Specific Objective 3.b

K/As 295037 K1.01 (4.3) 295037 A2.06 (4.1)
295037 SG.07 (3.9) 295037 SG.12 (4.6)

295037A206 295037G007 295037G012 295037K101 ..(KA's)

ANSWER: 083 (1.00)

d.

REFERENCE:

1. EO-100-103, Primary Containment Control, pg 23

2. PP002A: Emergency Operating Procedures - Specific Objective 6.c

K/As 295024 SG.07 (3.9) 295024 SG.12 (4.5)

295024G007 295024G012 ..(KA's)

ANSWER: 084 (3.00)

1, 3, 4, 6, 7, 8 (0.5 each)

REFERENCE:

1. EO-100-103, Primary Containment Control, pgs 16 thru 26 and Figures PC-4, PC-5 and PC-6

2. PPOO2A: Emergency Operating Procedures - Specific Objectives 3.c and 14

K/As 295024 A1.11 (4.2) 295024 A1.12 (3.8) 295024 A2.01 (4.4)
295024 A2.02 (4.0) 295024 A2.03 (3.8) 295024 A2.04 (3.9)
295024 A2.05 (3.7) 295024 SG.12 (4.5) 295028 A1.01 (3.9)
295028 A1.03 (3.9) 295028 A2.01 (4.1) 295028 A2.02 (3.9)
295028 A2.04 (4.2) 295028 A2.05 (3.8) 295028 A2.06 (3.7)
295028 SG.12 (4.3)

295024G012 295028G012 ..(KA's)

ANSWER: 085 (3.00)

a. 3 b. 4 c. 3
d. 5 or 3 e. 5 f. 3

REFERENCE:

1. SY017 L-11: Control Structure HVAC, pages 3 and 4 - Specific Objectives 5 and 6

2. SY017 E-2: Secondary Containment - Specific Objectives 2 and 6

K/As 295017 K2.04 (3.1/3.3) 295017 K2.07 (3.2/3.4)
288000 K1.02 (3.4/3.4) 288000 A2.04 (3.7/3.8)

288000A204 288000K102 295017K204 295017K207 ..(KA's)

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

QUESTION	VALUE	REFERENCE
001	1.00	9000001
002	1.00	9000002
003	2.50	9000003
004	2.00	9000004
005	1.00	9000005
006	1.00	9000006
007	1.00	9000007
008	1.00	9000016
009	1.00	9000017
010	1.00	9000018
011	1.00	9000019
012	1.00	9000020
013	1.00	9000021
014	1.00	9000022
015	1.00	9000023
016	1.00	9000026
017	1.00	9000027
018	1.00	9000028
019	2.00	9000029
020	1.00	9000030
021	2.00	9000031
022	1.00	9000033
023	1.00	9000034
024	1.00	9000036
025	1.00	9000037
026	1.00	9000052
027	3.00	9000053
028	1.00	9000054
029	1.00	9000055
030	1.00	9000056
031	1.00	9000057
032	1.00	9000058
033	1.00	9000059
034	1.00	9000060
035	1.00	9000061
036	1.00	9000062
037	1.00	9000063
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039	1.00	9000065
040	1.00	9000068
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042	1.00	9000070
043	1.00	9000071
044	1.00	9000072
045	1.00	9000073
046	1.00	9000074
047	1.00	9000075
048	1.00	9000076
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050	1.00	9000078
051	1.00	9000079
052	1.00	9000080
053	1.00	9000081
054	1.00	9000082

QUESTION	VALUE	REFERENCE
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056	3.00	9000032
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066	1.00	9000050
067	1.00	9000047
068	1.00	9000012
069	1.00	9000048
070	1.00	9000013
071	1.00	9000014
072	1.00	9000015
073	1.00	9000011
074	1.00	9000024
075	1.00	9000025
076	1.00	9000035
077	1.00	9000038
078	1.00	9000039
079	1.00	9000040
080	1.00	9000041
081	1.00	9000042
082	1.00	9000043
083	1.00	9000044
084	3.00	9000045
085	3.00	9000046
	100.00	
	100.00	

ATTACHMENT 2
Reactor Operator Written Examination and answer key

MASTER

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

FACILITY: Susquehanna 1 & 2

REACTOR TYPE: BWR-GE4

DATE ADMINISTERED: 90/04/10

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:

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

NUMBER QUESTIONS	TOTAL POINTS	CANDIDATE'S POINTS	CANDIDATE'S OVERALL GRADE (%)
~~83~~ 82 E 4-17-90	~~100.00~~ 99.00 E 4-17-90		

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. You should write your answers on the examination question page.

7. If 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.

8. Print your name in the upper right-hand corner of the first page of answer sheets. Initial each of the following answer pages including any additional sheets.

9. If you use any separate sheets, number each answer and skip at least 3 lines between answers to allow space for grading.

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

11. 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.

12. 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.

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

14. 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.

15. 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.

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

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

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

19. 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.)

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

QUESTION: 001 (1.00)

A special approval sequence is designated for issuing a permit clearance with the permit holder unavailable.

WHICH ONE (1) of the following correctly describes this approval sequence?

a. Permit holder's designee, Shift Supervisor, Plant Manager

b. System Operating (S.O.) Representative, Shift Supervisor, Supervisor of Operations

c. Permit holder's supervisor, Shift Supervisor, Plant Manager

d. Permit holder's supervisor, Shift Supervisor, Supervisor of Operations

QUESTION: 002 (1.00)

The 'A' CRD pump motor has a yellow tag on it.

WHICH ONE (1) of the following is correct concerning operation of the CRD pump?

a. The pump cannot be operated except at the request of the permit holder.

b. If the restrictions written on the tag are not met, the pump can be operated only with the permission of Shift Supervision.

c. The restrictions on the tag must be met to ensure personnel protection when operating the pump.

d. The pump can only be operated on the orders of the System Operating (S.O.) Representative.

QUESTION: 003 (2.50)

An operator is required to perform a valve lineup verification. None of the valves that need verification have any open/close position indication directly on the valve.

For EACH of the valve status conditions in Column A, SELECT the proper verification action from Column B. Verification actions from Column B may be used once, more than once or not at all.

COLUMN A (VALVE STATUS)	COLUMN B (VERIFICATION ACTION)
a. Manual valve in open position	1. Observe stem position
b. Manual valve in shut position	2. Observe remote position indication.
c. Electrically operated valve in shut position	3. Check in shut direction AND RETURN TO REQUIRED POSITION IF APPLICABLE
d. Lockwired flow balance valve	4. Check in open direction AND RETURN TO REQUIRED POSITION IF APPLICABLE
e. Manual valve in locked open position	5. Unlock valve and check in shut direction. AND RETURN TO REQUIRED POSITION IF APPLICABLE.
	6. Unlock valve and check in open direction AND RETURN TO REQUIRED POSITION IF APPLICABLE.
	7. Verify lock intact

QUESTION: 004 (2.00)

Procedure AD-QA-300, Conduct of Operations, specifies actions that must be taken when starting large electrical loads.

a. WHAT size loads are classifed as "Large Electrical Loads"? (Express answer in VAC) (0.5)

b. STATE the THREE (3) actions that must be performed prior to starting a large load. (0.5 each)

QUESTION: 005 (1.00)

The Hot Work Firewatch should stay on the job site during all cutting, welding, or grinding and for _____ after work is complete.

WHICH ONE (1) of the following correctly completes this statement?

a. 15 minutes

b. 30 minutes

c. 45 minutes

d. 60 minutes

QUESTION: 006 (1.00)

WHICH ONE (1) of the following is NOT correct concerning working with hydrogen in accordance with OP-074-001, "Hydrogen System Storage"?

a. Smoking or open flame is not allowed within 50 feet of hydrogen storage areas.

b. Explosive meters to monitor atmosphere are required only when working around hydrogen in enclosed areas.

c. Special tools are required when making hydrogen gas piping connections because they have reverse threads.

d. Connections should be made before opening hydrogen supply valves to prevent self-ignition of hydrogen.

QUESTION: 007 (1.00)

WHICH ONE (1) of the following jobs would NOT require a Radiation Work Permit (RWP) in accordance with AD-00-705, "Access Control and Radiation Work Permit System?"

a. Radiography performed following repairs to piping in the Service Water System.

b. Inspection of equipment in an Airborne Radioactivity Area. No work will be performed.

c. Repairs to an RHR pump that are expected to take 2 workers approximately 3 hours to complete. Radiation levels in the area are 5 mr/hr.

d. Welding of piping in the CRD System. Contamination levels on the piping are 200 dpm/cm2. The highest contaminatin levels in the room are 1200 dpm/cm2.

QUESTION: 008 (1.00)

Unit 1 is operating at 95% power at the 100% rod line when the "B" Recirculation Pump trips.

WHICH ONE (1) of the following conditions (if the condition occurred after the pump trip) would require a reactor scram?

a. Operation above the 80% rod line.

b. Operating loop drive flow greater than 37000 gpm.

c. LPRM oscillations of 10 w/cm2 peak to peak on a five second period.

d. Two or more APRM UPSCALE rod block alarms cycling on a five second period.

QUESTION: 009 (1.00)

WHICH ONE (1) of the following statements is NOT correct concerning core flux oscillations?

a. If out of phase power oscillations occur, the MCPR Safety Limit may be violated.

b. Out of phase power oscillations could lead to high local neutron flux levels without an automatic Scram.

c. Region II of the Power/Flow map must be exited IMMEDIATELY if entered.

d. Region II of the Power/Flow map has a higher probability of thermal hydraulic instabilities occurring than Region I.

QUESTION: 010 (1.00)

Unit 1 is operating at 85% power and experiences a problem with the Main Generator Stator Water Cooling system. Conditions are as follows:

"A" Stator Water Cooling Pump	- Tripped
"B" Stator Water Cooling Pump	- Running
Stator Cooling outlet temperature	- 79 degrees Celsius
Stator Cooling water inlet pressure	- 10 psig
Stator Cooling Tank level	- 10" below normal and decreasing

SELECT the ONE correct statement from those below.

a. The load on the Main Generator must be reduced below 24% in 70 seconds or the main turbine will trip.

b. The main turbine will automatically trip 70 seconds after the Stator Cooling water inlet pressure dropped below 13 psig.

c. The main turbine will automatically trip 70 seconds after the Stator Cooling outlet temperature reached 75 degrees Celsius.

d. The main turbine will automatically trip if the "B" Stator Water Cooling Pump trips after a 70 second time delay.

QUESTION: 011 (1.00)

WHICH ONE (1) of the following statements is correct concerning operation of the Emergency Service Water (ESW) system under degraded conditions?

a. ESW cannot meet design specifications with only three ESW pumps available for service.

b. System redundancy is ensured with three ESW pumps available because there is at least one pump available in each loop.

c. Any two ESW pumps will provide adequate cooling for four operating diesel generators.

d. Preferred operation with only two ESW pumps available is two ESW pumps in one loop.

QUESTION: 012 (1.00)

Unit 1 is operating at 100% power with A CRD pump tagged out for maintenance. Group 1 and Group 2 rods are completely withdrawn from the core. The following alarms are received in the control room:

CRD PUMP B TRIP
CRD PUMP B SUCTION LO PRESS
ACCUMULATOR TROUBLE LIGHTS (1 rod in Group 1 and 1 rod in Group 2)

WHICH ONE (1) of the following actions should the reactor operator take?

a. Monitor the FULL CORE DISPLAY for additional trouble lights.

b. Check Condensate Storage Tank (CST) level above 45%.

c. Bypass the suction filter and restart B CRD pump.

d. Scram the reactor.

QUESTION: 013 (1.00)

ON-118-001, "Loss of Instrument Air," requires a manual scram if air pressure cannot be restored and maintained above 65 psig.

WHICH ONE (1) of the following statements correctly describes the bases for this scram?

a. A scram at this point ensures that the reactor scram will be successful because Scram Discharge Volume (SDV) in-leakage from the drifting open of scram inlet and outlet valves could prevent a scram at a later time.

b. A scram at this point places the plant in a stable condition which allows the operators to direct their attention to other plant safety-related equipment that is affected by the loss of air.

c. A scram at this point prevents core flux OSCILLATIONS. which could result as the scram inlet and outlet valves drift open causing the control rods TO insert at different times.

d. A scram at this point anticipates the reactor water level control problems that will result from the effects of the loss of air on the Feedwater and Condensate systems.

QUESTION: 014 (1.00)

Technical Specification 3.9.9 requires at least 22 feet of water be maintained over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks.

WHICH ONE (1) of the following is the bases for this requirement?

a. This level ensures adequate flow through the skimmer surge tanks to remove irradiated fuel decay heat.

b. This level ensures that 99% of the iodine released from the rupture of an irradiated fuel assembly well be removed by the water.

c. This level ensures that the radiation level at the surface of the pool will not exceed 10 mrem/hr.

d. This level ensures that an irradiated fuel assembly raised to the upper limit on the refueling hoist, will not expose the bridge operator to more than 10 mrem/hr.

QUESTION: 015 (1.00)

Unit 1 is at 180^F with the mode switch in SHUTDOWN. One loop of RHR is inoperable due to a problem with RHR Service Water. The other loop of RHR was operating in Shutdown Cooling mode when a spurious signal caused the Shutdown Cooling isolation valves to close.

WHICH ONE (1) of the following methods is an acceptable means of immediately establishing reactor coolant circulation in accordance with ON-149-001, "Loss of RHR Shutdown Cooling Mode?"

a. Maintain RPV level above 40 inches to establish natural circulation.

b. Establish a "feed and bleed" flowpath with the Condensate System and Reactor Water Cleanup (RWCU) Letdown.

c. Operate the Core Spray system to feed the RPV from the suppression pool and reject through 6 SRVs.

d. Operate the Reactor Recirculation system with at least one pump at approximately 30% pump speed in accordance with OP-164-001.

QUESTION: 016 (1.00)

In accordance with EO-100-030, "Unit 1 Response to Station Blackout," WHICH ONE (1) of the following describes the systems that should be used to depressurize the RPV during a prolonged Station Blackout?

a. RCIC and HPCI

b. RCIC and up to 10 SRVs

c. HPCI and up to 10 SRVs

d. HPCI and up to 6 SRVs

QUESTION: 017 (1.00)

A fire in the cable spreading room has forced the control room to be abandoned.

WHICH ONE (1) of the following actions, as a minimum, is required to be performed prior to leaving the control room to ensure Safe Shutdown capabilities?

a. Place MODE SWITCH in SHUTDOWN

b. Insert SRM's and IRM's

c. Close MSIV's

d. Close RFP discharge valves

QUESTION: 018 (1.00)

EO-100-009, "Plant Shutdown from Outside the Control Room," directs the operator to place the Instrumentation Transfer switches on the Remote Shutdown Panel to the EMERG position. This bypasses the Main Control Room devices.

WHICH ONE (1) of the following is the reason for bypassing the Control Room controls?

a. Enables automatic protective features that may have been damaged in the fire.

b. Prevents spurious equipment operation.

c. Prevents further damage to equipment electrical systems.

d. Precludes problems of mutual inductance in long cable runs.

QUESTION: 019 (2.00)

The reactor is operating at 30% power when condenser vacuum begins to decrease.

For each of the automatic actions in Column A, SELECT the setpoint at which the action occurs from Column B. Items in Column B may be used once, more than once or not at all.

COLUMN A (ACTIONS)		COLUMN B (SETPOINTS)	
a.	Main turbine TRIP	1.	7.4" inches Hg Absolute
b.	Turbine bypass valves CLOSE	2.	8.2" inches Hg Absolute
c.	Main Steam Line ISOLATION	3.	10.5" inches Hg Absolute
d.	Reactor Feed Pump turbine TRIP	4.	12.5" inches Hg Absolute
		5.	19.7" inches Hg Absolute
		6.	22.9" inches Hg Absolute
		7.	23.4" inches Hg Absolute

QUESTION: 020 (1.00)

EO-100-101, "Scram", directs the operator to reset the main generator lockout if conditions permit in accordance with ON-193-002, "Main Turbine Trip."

SELECT the correct bases for this step from the reasons listed below.

a. To allow the Recirc pumps to be restarted to establish forced reactor coolant circulation.

b. To prevent a trip of the Stator Water Cooling pumps.

c. To allow the Stator Water Cooling pumps to be restarted to provide cooling to the main generator.

d. To prevent a plant auxiliary load shed.

QUESTION: 021 (2.00)

Unit 2 is operating at 87% reactor power. Main Steam Line radiation levels are 9 times Normal Full Power Background (NFPB) and increasing. No automatic actions have occurred.

STATE ALL the immediate operator actions required.

QUESTION: 022 (1.00)

WHICH ONE (1) of the following is NOT one of the reasons why ADS valves are preferred for rapid RPV depressurization?

a. ADS discahrge distribution will minimize uneven suppression pool heatup.

b. All 6 ADS valves can be opened simultaneously using the manual initiation pushbuttons.

c. The ADS system was designed to rapidly reduce pressure and not apply undue stress to the pressure vessel and internals.

d. The ADS valves have a more reliable pneumatic supply than the other SRVs.

QUESTION: 023 (1.00)

EO-100-112, "Rapid Depressurization", directs the operator to use alternate depressurization means if Suppression Pool level is below five (5) feet.

SELECT the reason for this requirement.

a. At 5 feet, level is below the Suppression Pool temperature detectors resulting in inaccurate temperature readings.

b. With level below 5 feet, there is insufficient heat capacity in the suppression pool to assure steam condensation.

c. Downcomer vent lines are uncovered at 5 feet, resulting in loss of pressure suppression capabilities.

d. SRV discharge line spargers are not adequately submerged at 5 feet to prevent containment overpressurization.

QUESTION: 024 (1.00)

EO-103, "Primary Containment Control," directs the operator to run drywell coolers in slow if hydrogen concentration is above 3% by volume.

SELECT the correct bases for running drywell coolers in this situation.

a. Drywell cooling will cause condensation of the hydrogen and oxygen reducing the pressure in the drywell.

b. Drywell cooling increases the efficiency of the hydrogen recombiners in reducing hydrogen concentration.

c. Drywell cooling will mix the drywell atmosphere to avoid pockets of high hydrogen concentrations.

d. Drywell cooling and the resultant lower temperature reduces the chances of ignition of the hydrogen.

QUESTION: 025 (1.00) DELETED DUE TO FACILITY COMMENT

WHICH ONE (1) of the following conditions would require a reactor scram in accordance with EO-100-104, "Secondary Containment Control?"

a. An area radiation level exceeds the "Max Normal" level.

b. An area radiation level exceeds ten times the alarm level.

c. An area radiation level exceeds ten times the "Max Normal" level.

d. A primary system required to shutdown the reactor discharging into an area resulting in area radiation levels above the "Max Normal" level.

QUESTION: 026 (1.00)

Given the following initial conditions:

- Reactor Power at 25%
- Generator output at 25%
- Reactor Pressure at 931.5 psig
- Throttle Pressure at 927.5 psig
- EHC Pressure Setpoint set at 920 psig
- Load Selector set at 30%
- Load Limit set at 100%
- Maximum Combined Flow set at 105%
- Recirc pumps in manual operating at 30% SPEED.
- Synchronous Speed Selected
- Not on the bypass jack
- Pressure regulator "A" in control

WHICH ONE (1) of the following correctly describes the plant response if the "B" pressure regulator output fails high? (REFER TO FIGURE 1).

a. The bypass valves will open. Reactor pressure will increase and the reactor will stabilize at a higher power level.

b. The bypass valves will remain as is. Reactor pressure will increase and the reactor will scram on an APRM upscale trip.

c. The bypass valves will open. Reactor pressure will decrease and the reactor will scram on MSIV closure due to low pressure.

d. The bypass valves will remain as is. Reactor pressure will not change because pressure regulator "A" is in control.

QUESTION: 027 (3.00)

For each of the conditions given in Column A, SELECT ALL of the components/systems from Column B which receive an isolation signal as the parameter changes from normal value (AT 100% POWER) to the present condition. Consider each condition seperately.

Note: The responses from Column B may be used once, more than once, or not at all. If none of the components/systems receive an isolation signal, select NONE.

COLUMN A (Condition)	COLUMN B (Component/System)
a. Reactor Water Level: -120 inches	1. MSIVs
b. Reactor Pressure: 400 psig (Mode Switch in SHUTDOWN)	2. RBCCW to Drywell Coolers
c. Drywell Pressure: 2.5 psig	3. RBCCW to Recirc Pumps
d. Main Steam Line Flow: 110 psid	4. Reactor Coolant Sample Valves (FO19 & FO20)
e. Main Steam Line Radiation: 7.5 x NFPB	5. RHR Sample Valves (FO79 & FO80)
f. Main Steam Line Tunnel Temp: 170^F	6. RHR Shutdown Cooling Suction Valves (FO08 & FO09)
	7. NONE

QUESTION: 028 (1.00)

A small break LOCA has occurred, causing the Emergency Diesel Generators to auto start on high drywell pressure. Emergency Diesel Generator "A" trips shortly after startup.

WHICH ONE (1) of the following would cause "A" Emergency Diesel Generator to trip under these conditions?

a. High jacket water temperature.

b. Engine overspeed.

c. Low Turbocharger oil pressure.

d. Generator overvoltage.

QUESTION: 029 (1.00)

The reactor is operating at 100% power when a Rod Drift alarm on rod 18-19 is received.

WHICH ONE (1) of the following is a potential cause for the rod drift?

a. Low Instrument Air system pressure.

b. Automatic start of the standby CRD pump.

c. Overcharged nitrogen accumulator.

d. Leaking piston seal on scram accumulator.

QUESTION: 030 (1.00)

The reactor is operating at 75% power when 125 VDC panel 1D614 is deenergized. A reactor scram signal on Reactor Protective System channels "A" and "B" is then received.

WHICH ONE (1) of the following correctly describes the response of the Control Rod Hydraulic System?

a. Scram pilot valves energize to vent air header.

b. Scram pilot valves fail "as is".

c. Backup scram valves energize to vent air header.

d. Backup scram valves fail "as is".

QUESTION: 031 (1.00)

During normal power operations, the temperature of the downstream piping of an SRV valve should be approximately _____. In the event of an SRV leaking past its closed seat, the temperature of the downstream piping will increase. In this case, an alarm will actuate at a downstream piping temperature of _____.

WHICH ONE (1) of the following sets of temperatures correctly completes these statements?

a. 85 degrees F, 225 degrees F

b. 135 degrees F, 225 degrees F

c. 85 degrees F, 250 degrees F

d. 135 degrees F, 250 degrees F

QUESTION: 032 (1.00)

Unit 1 has experienced a valid automatic initiation of the Automatic Depressurization System (ADS). Plant conditions are as follows:

- Drywell pressure: 1.2 psig
- Reactor water level: -147 inches
- Reactor pressure: 150 psig
- RHR pumps: All running
- Core Spray pumps: All running
- ADS SRVs: 6 open
- 102 second timer: timed out
- 7 minute timer: timed out

WHICH ONE (1) of the following will cause the ADS SRVs to close?

a. The low pressure ECCS pumps raise reactor water level to -20 inches and both ADS LOGIC TIMER RESET buttons are depressed.

b. The ADS manual inhibit switches are placed in "inhibit" after reactor water level is raised above Level 1 (-129").

c. Drywell pressure decreases to 0.9 psig and both ADS High Drywell Pressure Initiation Reset buttons are depressed.

d. All RHR and Core Spray pumps are secured.

QUESTION: 033 (1.00)

While manually starting the RCIC system, the reactor operator is unable to increase turbine speed above 700 rpm.

WHICH ONE (1) of the following conditions could be a cause of this problem?

a. Steam supply pressure of 150 psig.

b. Failure of the ramp generator.

c. Failure of the low signal selector.

d. Improper reset of the trip throttle valve.

QUESTION: 034 (1.00)

A RCIC turbine trip occurred and the procedure has just been completed to reset the trip. No RCIC initiation signal is present.

WHICH ONE (1) of the following indications on the 4 position indication lamps above the handswitch for the RCIC turbine trip and throttling valve would indicate that the trip was reset properly and the RCIC turbine is ready to operate?

a. Both amber lamps illuminated, both red lamps extinguished.

b. Both amber lamps extinguished, both red lamps illuminated.

c. One amber lamp and one red lamp illuminated.

d. Both amber lamps and both red lamps illuminated.

QUESTION: 035 (1.00)

Reactor Recirculation flow is 60% when the reactor recirculation pumps runback to 45% without any operator actions.

WHICH ONE (1) of the following could have caused the recirculation pump runback?

a. Reactor steam flow < 20% and reactor water level < 13 inches.

b. RFP "A" feed flow < 20% and reactor water level < 30 inches.

c. RFP "B" feed flow < 20% and reactor water level < 13 inches.

d. Reactor steam flow < 20% and reactor water level < 30 inches.

QUESTION: 036 (1.00)

When operating with only one Reactor Recirculation pump running, erroneous flow indications may be observed.

WHICH ONE (1) of the following correctly describes the reason for the erroneous flow indications?

a. The flow summer (FY-1K607) only measures flow in the operating loop resulting in erroneous indicated core flow.

b. With jet pump flow > 38 x 10^6 lm/hr, forward flow in the non-operating loop is not accounted for resulting in indicated flow lower than actual core flow.

c. With jet pump flow < 38 X 10^6 lm/hr, forward flow in the non-operating loop is not accounted for resulting in indicated flow lower than actual core flow.

d. With jet pump flow < 38 x 10^6 lm/hr, reverse flow in the non-operating loop is not accounted for resulting in indicated flow higher than actual core flow.

QUESTION: 037 (1.00)

The reactor is operating at 100% power and reactor pressure is 1005 psig. Reactor Recirculation Pump Lower Seal pressure is 1150 psig and Upper Seal pressure is 850 psig.

These indications are indicative of _____. (Choose ONE)

a. Normal system parameters.

b. Failure of the Upper Seal

c. Failure of the Lower Seal.

d. Failure of both the Lower and Upper Seals.

QUESTION: 038 (1.00)

A plant startup is in progress. Reactor pressure is 400 psig. The Feedwater Low Flow Controller (LIC-R602) has just been placed in automatic and adjusted to control at 30 inches.

WHICH ONE (1) of the following describes the response of LV-10641 and the effect on reactor water level if air is lost to Startup Level Control valve LV-10641?

a. LV-10641 fails open increasing reactor water level.

b. LV-10641 fails open decreasing reactor water level.

c. LV-10641 fails closed increasing reactor water level.

d. LV-10641 fails closed decreasing reactor water level.

QUESTION: 039 (1.00)

The plant is operating at 100% power with the Feed Water Level Control System (FWLC) operating in three element control and the Level Select Switch on panel 1C651 selected to instrument "A". A malfunction in the FWLC system occurs such that reactor water level decreases and stabilizes at a lower reactor water level.

WHICH ONE (1) of the following instrument failures could have caused this problem?

a. "A" reactor water level instrument fails low.

b. "B" reactor water level instrument fails high.

c. "A" steam flow instrument fails high.

d. "B" steam flow instrument fails low.

QUESTION: 040 (1.00)

Consider the following information:

- The reactor is at 5% power
- APRM CHANNEL A is reading 5%
- APRM CHANNEL E is reading 5%
- APRM CHANNEL F is reading 4%
- IRM CHANNEL A is reading 105%
- IRM CHANNEL G is reading 106%
- IRM CHANNEL H is reading 125%
- The Mode Selector Switch is in STARTUP.

WHICH ONE (1) of the following correctly describes the automatic actions that should occur?

a. Rod block but no half scram

b. Half scram but no rod block

c. Rod block and half scram

d. No rod block and no half scram

QUESTION: 041 (1.00)

Consider all the following information:

- The reactor is at 100% power
- APRM CHANNEL A is reading 103%
- RBM CHANNEL A is reading 97%
- RBM CHANNEL B is reading 99%
- FLOW DRAWER A output is 90%
- FLOW DRAWER B output is 95%
- FLOW DRAWER C output is 102%
- FLOW DRAWER D output is 98%
- 5 LPRM signals to APRM CHANNEL A are bypassed (3 level A, 2 level B)
- RBM alarm ref. set high

WHICH ONE (1) of the following alarms would be received?

a. RPS CHANNEL A1/A2 AUTO SCRAM

b. APRM UPSCALE

c. APRM CHAN A, C, E, UPSCALE OR INOP TRIP

d. RBM UPSCALE OR INOP ROD BLOCK

QUESTION: 042 (1.00)

With the meter function switch in COUNT, the meter on the Power Range Monitoring Cabinet for APRM "C" reads 80%.

WHICH ONE (1) of the following statements is correct concerning the number of operable LPRMs on APRM "C"?

a. 80% of the Technical Specification required LPRMs for APRM "C" are operable.

b. Eight (8) LPRMs for APRM "C" are operable.

c. Sixteen (16) LPRMs for APRM "C" are operable.

d. The meter function switch must be taken to the "A", "B", "C", and "D" positions to determine the number of operable LPRMs for APRM "C".

QUESTION: 043 (1.00)

A TIP Trace is being taken on Unit 1 when a Reactor Feedwater pump trip occurs causing reactor water level to drop below Level 3 (+13 inches).

WHICH ONE (1) of the following correctly describes the response of the TIP system?

a. The TIP Shear Valve automatically fires to cut the detector cable and seal the guide tube.

b. The TIP Guide Tube Ball Valve automatically closes, cutting the detector cable and sealing the guide tube.

c. The TIP will go to the Manual Reverse Mode and withdraw, allowing the Ball Valve to close to seal the guide tube.

d. No automatic actions occur.

QUESTION: 044 (1.00)

WHICH ONE (1) of the following components internal to the reactor vessel assures that adequate core flow is provided to the high powered fuel bundles?

a. Peripheral Fuel Support

b. Orificed Fuel Support

c. Fuel Channel

d. Incore Guide Tube

QUESTION: 045 (1.00)

Unit 2 is operating at 45% power with Condensate Pumps "A", "B", and "D" in service. A Loss of Coolant Accident (LOCA) occurs simultaneously with a Main Generator Lockout.

WHICH ONE (1) of the following correctly describes the response of the condensate pumps?

a. The "A" and "B" Condensate pumps will trip immediately while the "D" pump will remain running.

b. All three running Condensate pumps will trip immediately and the "C" pump can be manually started after a 25-30 second time delay.

c. The "A" and "B" Condensate pumps will trip immediately and the "D" pump will trip after a 25-30 second time delay.

d. All three running Condensate pumps will trip immediately and the "D" pump will auto start after a 25-30 second time delay.

QUESTION: 046 (1.00)

The Unit 1 Off Gas Recombiner is being placed in service in accordance with OP-172-001, "Off Gas System." The recombiner is in STANDBY mode.

WHICH ONE (1) of the following actions occurs when the Unit 1 Off Gas Recombiner STANDBY/PRESTART mode switch is taken to "PRESTART?"

a. Recycle valve HV-16904 opens.

b. Off Gas isolation protection circuits are enabled.

c. STANDBY mode is "sealed in" (OFF/STANDBY mode switch disabled).

d. Heat trace piping high temperature alarms are disabled.

QUESTION: 047 (1.00)

All rods in Group 1 are fully inserted except rod 14-19, which is fully witdrawn. All rods in group 2 and 3 are fully withdrawn. All rods in group 4 are at position 42. All rods in group 5 through 9 are fully inserted. The Rod Worth Minimizer system has been initialized. Note: A list of the rod groups with the assigned rods, insert limits and withdraw limits is attached as Figure 2.

WHICH ONE (1) of the following rods will be displayed in the withdraw error window?

a. 14-19

b. 14-31

c. 18-23

d. 22-15

QUESTION: 048 (1.00)

All rods in Group 1 are fully inserted except rod 14-19, which is fully witdrawn. All rods in group 2 and 3 are fully withdrawn. All rods in group 4 are at position 42. All rods in group 5 through 9 are fully inserted. The Rod Worth Minimizer system has been initialized. Note: A list of the rod groups with the assigned rods, insert limits and withdraw limits is attached as Figure 2.

WHICH ONE (1) of the following control rods can be moved?

a. 14-19

b. 14-35

c. 22-15

d. 22-31

QUESTION: 049 (1.00)

WHICH ONE (1) of the following conditions will cause all SRM rod blocks to be bypassed?

a. All IRM's on range 3 or above.

b. SRM's read greater than 100 counts.

c. All IRM's are on range 8 or above.

d. SRM's read greater than 2 X 10^5 counts.

QUESTION: 050 (1.00)

During fuel loading with nine (9) or more bundles loaded into the core, the SRMs are required to read . . . [CHOOSE ONE]

a. at least 3.0 counts per second AND have a signal to noise ratio of greater than 2.0.

b. at least 3.0 counts per second OR at least 0.7 counts per second if the signal to noise ratio is less than 2.0.

c. at least 3.0 counts per second OR at least 0.7 counts per second if the signal to noise ratio is greater than 2.0.

d. at least 0.7 counts per second OR at least 3.0 counts per second if the signal to noise ratio is greater than 2.0.

QUESTION: 051 (1.00)

The Refueling Bridge is located over the Spent Fuel Pool during Unit 1 refueling operations. Unit 1 plant conditions are as follows:

- ONE (1) control rod is withdrawn
- Reactor selector switch is in NORMAL
- Refueling platform is heading toward the Unit 1 reactor

WHICH ONE (1) of the following conditions will allow bridge motion in the REVERSE direction?

a. Refueling switch #1 is activated and the main hoist is loaded to 600 pounds.

b. External switch in the Control Room is in STARTUP and refueling switch #2 is activated.

c. External switch in the Control Room is in STARTUP and the frame mounted auxiliary hoist is loaded to 250 pounds.

d. Refueling switch #1 is activated and the monorail auxiliary hoist is loaded to 450 pounds.

QUESTION: 052 (1.00)

Both units were operating at 100% power when a Loss of Coolant Accident (LOCA) occurred on Unit 2. Note: All systems were lined up in the normal configuration for 100% power operation.

WHICH ONE (1) of the following correctly describes the response of reactor building ventilation and the Standby Gas Treatment system (SGTS)?

a. Reactor Building Zones II and III isolate. SGTS fans "A" and "B" start.

b. Reactor Building Zone II isolates. SGTS fan "A" starts.

c. Reactor Building Zones I, II and III isolate. SGTS fans "A" and "B" start.

d. Reactor Building Zones II and III isolate. SGTS fan "B" starts.

QUESTION: 053 (1.00)

Unit 1 is operating the "A" Residual Heat Removal system in the Shutdown Cooling Mode. Reactor water level begins decreasing and reaches +13 inches.

WHICH ONE (1) of the following correctly describes the effect on the RHR system?

a. F047A (RHR Heat Exchanger Inlet) closes, F020 (Head Spray Shutoff) closes, F008 and F009 (Shutdown Cooling Suctions) close

b. F015A (RHR Injection) closes, F022 (Head Spray Shutoff) closes, F006A and F006C (Shutdown Cooling Suctions) close

c. F015A (RHR Injection) closes, F023 (Head Spray Flow Control) closes, F008 and F009 (Shutdown Cooling Suctions) close

d. F048A (RHR Heat Exchanger Bypass) opens, F023 (Head Spray Flow Control) closes, F006A and F006C (Shutdown Cooling Suctions) close

QUESTION: 054 (1.00)

In preparation for startup of shutdown cooling, OP-149-002, "RHR Operation in Shutdown Cooling Mode", requires a check of the suppression pool/shutdown cooling suction valve interlock.

WHICH ONE (1) of the following correctly describes this interlock?

a. The F004 valve (Suppression Pool Suction) cannot be opened with the respective F006 valve (Shutdown Cooling Suction) open to prevent draining the reactor vessel to the suppression pool.

b. The F006 valve (Shutdown Cooling Suction) cannot be opened with the respective F024 valve (Test Line Return) open to prevent pumping reactor vessel water into the suppression pool.

c. The F008 and F009 valves (Shutdown Cooling Suction) cannot be opened with any of the F004 valves (Suppression Pool Suction) open to prevent draining the reactor vessel to the suppression pool.

d. The RHR pump cannot be started unless the respective F004 valve (Suppression Pool Suction) and F006 valve (Shutdown Cooling Suction) are open to ensure adequate Net Positive Suction Head (NPSH) for the pump.

QUESTION: 055 (1.00)

Unit 1 is operating both Residual Heat Removal systems in the Suppression Pool Cooling Mode providing maximum cooling. A spurious Division I LPCI initiation signal is received.

WHICH ONE (1) of the following correctly describes the lineup of the RHR systems following the spurious signal?

a. F015A (RHR Injection) open, F028A (Suppression Chamber Spray Test Shutoff) open, F031A (Recirc Pump "A" Discharge) closed

b. F015A (RHR Injection) open, F024A (Test Return) closed, F028A (Suppression Chamber Spray Test Shutoff) closed

c. F015B (RHR Injection) open, F024B (Test Return) closed, F031A (Recirc Pump "A" Discharge) closed

d. F015B (RHR Injection) open, F024A (Test Return) closed, F048B (RHR Heat Exchanger Shell Side Bypass) closed

QUESTION: 056 (3.00)

For each of the conditions/situations in Column A, SELECT ALL of the Emergency Operating Procedures from Colunm B that should be entered. Consider each condition separately. Note: Each procedure from Column B may be used once, more than once, or not at all.

	COLUMN A (Condition)		COLUMN B (Procedure)
a.	Suppresion Pool Temperature at 108^F	1.	EO-102, "RPV Control"
b.	HPCI Equipment Room Temperature at 150^F	2.	EO-103, "Primary Containment Control"
c.	Drywell Pressure at 3.5 psig	3.	EO-104, "Secondary Containment Control
d.	RCIC Steam Flow at 180 inches of water	4.	EO-105, "Radioactivity Release Control"
e.	Zone III HVAC Exhaust Radiation at 5.0 mR/hr	5.	None Applicable
f.	MSIV Isolation		

QUESTION: 057 (2.00)

For each of the conditions listed in Column A, SELECT the type of controlled area from Column B. Items from Column B may be used once, more than once or not at all.

COLUMN A (Conditions)	COLUMN B (Controlled area)
a. 250 mr/hr	1. Contaminated Area
b. 600 mr/hr	2. High Radiation Area
c. 400 dpm/cm2 alpha	3. Double-locked High Radiation Area
d. 10 R/hr	4. Radiation Area
	5. Locked High Radiation Area
	6. Airborne Radioactivity Area
	7. Uncontrolled Area

QUESTION: 058 (1.00)

In accordance with AD-00-735, "External Dosimetry Program, individual quarterly whole body exposures of up to _____ are permissible provided that a completed and signed Form NRC-4 is on file and the individual's lifetime exposure has not been exceeded. The quarterly exposure limit for the skin of the whole body is _____.

WHICH ONE (1) of the following correctly completes these statements?

a. 0.25 R; 10 R

b. 0.25 R; 5 R

c. 2.5 R; 10 R

d. 2.5 R; 5 R

QUESTION: 059 (1.00)

WHICH ONE (1) of the following conditions is NOT one of the conditions which allows for Emergency Core Cooling systems to be manually overridden?

a. When directed by an Emergency Operating Procedure.

b. Misoperation in the automatic mode is confirmed by two (2) independent means.

c. Adequate core cooling is confirmed by two (2) independent means.

d. When directed by the plant manager.

QUESTION: 060 (1.00)

A rupture of a main steam line has resulted in the initiation of the Reactor Core Isolation Cooling (RCIC) system on reactor water level of -30 inches (Level 2) and decreasing. RCIC is taking a suction on the Condensate Storage Tank (CST) and is injecting into the vessel. The breaker for 250 VDC panel 1D254 trips open deenergizing the panel.

WHICH ONE (1) of the following combinations of RCIC components are affected by deenergizing panel 1D254?

a. HV-15012 (TRIP THROTTLE VALVE) and F045 (Steam admission valve).

b. F007 (Inboard Steam Isolation) and F008 (Outboard Steam Isolation)

c. F062 (Vacuum Breaker Isolation) and F007 (Inboard Steam Isolation)

d. F031 (Suppression Pool Suction) and F010 (Condensate Storage Tank Suction)

QUESTION: 061 (1.00)

The plant is operating at 60% power with the Feed Water Level Control System (FWLC) operating in three element control and the Level Select Switch on panel 1C651 selected to instrument "B".

WHICH ONE (1) of the following correctly describes the effect on reactor water level if level instrument "B" fails downscale with no operator action?

a. Reactor water level will increase to Level 8 (+54 inches) and trip the main turbine.

b. Reactor water level will increase to a higher steady state level.

c. Reactor water level will decrease to Level 3 (+13 inches) and the reactor scrams.

d. Reactor water level will decrease to a lower steady state value.

QUESTION: 062 (1.00)

An Anticipated Transient Without Scram has occured and the Shift Supervisor has directed Standby Liquid Control be initiated. When the reactor operator places the SLC keylock switch to START, the SLC pumps do NOT start.

WHICH ONE (1) of the following systems can be used as an alternate means to inject SLC?

a. RCIC

b. HPCI

c. Feedwater

d. Core Spray

QUESTION: 063 (1.00)

The level of Sodium Pentaborate solution in the SLC Storage tank is measured by two (2) means. They are a _____ and a (an) _____.

WHICH ONE (1) of the following choices correctly completes the statement above?

a. bubbler system; fixed displacer

b. bubbler system; Ultrasonic level detector

c. differential pressure meter; Ultrasonic level detector

d. differential pressure meter; fixed displacer

QUESTION: 064 (1.00)

The reactor is operating at 100% power when APRM "A" fails downscale.

WHICH ONE (1) of the following describes the automatic action(s) that should occur?

a. Rod block

b. Half scram

c. Rod block and half scram

d. No rod block and no half scram

QUESTION: 065 (1.00)

The reactor operator looks at IRM "A" recorder on 1C652 and observes that it is reading 30 on scale 7.

WHICH ONE (1) of the following is the equivalent reactor power?

a. 0.102 percent power

b. 0.320 percent power

c. 1.02 percent power

d. 3.20 percent power

QUESTION: 066 (1.00)

A reactor startup is in progress and the main turbine generator has been tied to the grid.

Given the following conditions:

Reactor Power = 25%
Generator output = 25%
Reactor Pressure = 931.5 psig
Throttle Pressure = 927.5 psig
EHC Pressure Setpoint = 920 psig
EHC is aligned for normal power operation.
Pressure regulator A in control
(Refer to Figure 1.)

The "A" pressure regulator fails downscale which causes the "B" pressure regulator to automatically take over. This will cause the control valves to _____ until reactor pressure eventually stabilizes at _____.

WHICH ONE (1) of the following correctly completes this statement?

a. close down, 934.5 psig

b. open up, 934.5 psig

c close down, 928.5 psig

d. open up, 928.5 psig

QUESTION: 067 (3.00)

For EACH of the automatic actions in Column A, SELECT the reactor water level from Column B at which the action occurs. Reactor water levels from Column B may be used once, more than once, or not at all.

Column A (AUTOMATIC ACTION)		Column B (REACTOR WATER LEVEL)	
a.	RCIC F045 shuts	1.	54"
b.	Reactor SCRAM	2.	39"
c.	Initiate LPCI	3.	30"
d.	Reactor water HIGH level alarm	4.	13"
e.	RHR System Isolation	5.	-38"
f.	ADS Confirmatory signal	6.	-129"

QUESTION: 068 (1.00)

The 125 VDC system batteries are designed to last _____ at full load.

WHICH ONE (1) of the following correctly completes this statement?

a. 4 hours

b. 40 hours

c. 400 ampere-hours

d. 4000 ampere-hours

QUESTION: 069 (1.00)

The reactor is operating at 34% power when condenser vacuum begins decreasing. The reactor operator immediately starts inserting rods with the "CONTINUOUS INSERT" switch to reduce power below 5%. Reactor power is not decreasing quickly enough to prevent a turbine trip on low condenser vacuum, so the Shift Supervisor orders peripheral control rods scrammed from the individual rod scram test switches.

WHICH ONE (1) of the following is the consequence of individually scramming control rods in this situation?

a. The Reactor Sequence control System (RSCS) will be rendered inoperative.

b. The Rod Worth Minimizer will be rendered inoperative.

c. The Rod Block Monitor will limit control rod insertion to one notch below 22 % reactor power.

d. Increased potential for fuel damage due to operation with unanalyzed rod pattern.

QUESTION: 070 (1.00)

A turbine generator trip with a coincident failure of the turbine steam bypass valves in the closed position has occured at the end of core life following a 200 day run near rated power. All (16) sixteen safety relief valves have lifted.

The SRVs will prevent RPV pressure from exceeding _____.

WHICH ONE (1) of the following pressures correctly completes this statement?

a. 1076 psig

b. 1116 psig

c. 1250 psig

d. 1375 psig

QUESTION: 071 (1.00)

The suppresion pool cooling subsystem is designed to limit suppression pool water temperatue immediately after an ADS blowdown to _____ when reactor pressure is above _____.

WHICH ONE (1) of the following correctly completes this statement?

a. 95 degrees F, 1000 psig

b. 105 degrees F, 1000 psig

c. 110 degrees F, 135 psig

d. 170 degrees F, 135 psig

QUESTION: 072 (2.50)

TWO (2) of the SIX (6) signals that will actuate the Off Gas Recombiner Trip Circuitry are hydrogen concentration high-high (2%) and low-low dilution steam flow (8000 gpm).

a. LIST the remaining FOUR (4) initiation signals and their setpoints. (2.0)

b. WHICH signal uses a 1 out of 2 trip logic circuitry? (0.5)

QUESTION: 073 (1.50)

WHAT THREE (3) conditions will cause a RBM to be bypassed?

QUESTION: 074 (1.00)

The Rod Block Monitoring system has a low, intermediate, and high trip units whose set points are .66Wr + ____, .66Wr + ____, and .66Wr + ____ respectively and a backup trip unit whose setpoint is .66Wr + ____.

WHICH ONE (1) of the following correctly completes the above statement?

a. 25%, 32%, 43%, 54%

b. 25%, 33%, 42%, 54%

c. 23%, 30%, 42%, 54%

d. 23%, 33%, 42%, 60%

QUESTION: 075 (1.00)

Unit 1 is operating at 100% power. The Feedwater Level Control system is in three element control using level instrument "A". Level instrument "A" fails high causing the feedwater pump to reduce flow. Reactor water level , as measured by level instrument "B", indicates +27 inches and decreasing.

WHICH ONE (1) of the following correctly describes the response of the Reactor Recirculation pumps?

a. Runback to 45% flow.

b. Runback to 30% flow.

c. Trip at level 8.

d. Continue to run at 100% flow.

QUESTION: 076 (1.00)

ON-164-002, Loss of Reactor Recirculation flow cautions the operator not to close the reactor recirculation pump isolation valves for more than five (5) minutes.

WHICH ONE (1) of the following is the reason for this caution?

a. Reduces probability of thermal binding

b. Prevents pump from seating on its thrust bearing

c. Ensures adequate pressure locking

d. Prevents overheating pump seals

QUESTION: 077 (2.50)

Procedure ON-164-003 Reactor Recirculation Pump Dual Seal Failure requires isolating the associated reactor recirculation pump in the reverse order of normal operating practice.

a. WHAT valve sequence must be used for the operation? (Three responses required) (1.5)

b. EXPLAIN the basis for the valve sequence? (1.0)

QUESTION: 078 (1.00)

ON-193-002, Main Turbine Trip directs the operator to ensure that the Reactor Recirculation pumps trip if reactor power is greater than 24%.

WHICH ONE (1) of the following is the reason for this Recirculation pump trip?

a. Prevent pump cavitation

b. Counteract reactor water level swell

c. Insert negative reactivity

d. Decrease electrical load on system

QUESTION: 079 (1.00)

During refueling operations, Shutdown cooling is lost. Reactor coolant temperature begins to increase.

In accordance with the Technical Specification definition of Shutdown Margin, WHICH ONE (1) of the following statements is correct concerning the temperature increase?

a. Shutdown Margin will decrease, because less neutron moderation is taking place.

b. Shutdown Margin is unaffected, because reactor coolant temperature is not a factor in calculating Shutdown Margin.

c. Shutdown Margin is unaffected, because Shutdown Margin is calculated for a cold, xenon-free core.

d. Shutdown Margin will increase, because rod worth increases due to the temperature increase.

QUESTION: 080 (2.00)

EO-100-103, Primary Containment Control, step PC/P-8 states:

BEFORE SUPPRESSION CHAMBER PRESSURE REACHES LOWER CURVE (Figure PC-4 attached), INITIATE SUPP POOL SPRAYS, UNLESS SUPP POOL WATER LVL > 47'

1. SELECT the correct bases for the Pressure Suppression Pressure curve. (1.0)

   a. Above the curve, it is not guaranteed suppression pool temperature will be within design limits.

   b. Above the curve it is not guaranteed suppression pool level will be within design limits.

   c. Above the curve the suppression pool is unable to completely condense the steam during a blowdown.

   d. Above the curve it is not guaranteed suppression chamber pressure will be within design limits during a blowdown.

2. WHY is suppression pool spray prohibited above 47'? (1.0)

QUESTION: 081 (1.00)

EO-100-104, Secondary Containment Control step SC-3 specifies to start Standby Gas Treatment System if the Secondary Containment HVAC system is not operating.

WHICH ONE (1) of the following is the bases for this step?

a. Maintain containment temperature below 135 degrees

b. Maintain positive containment pressure

c. Maintain negative containment pressure

d. Reduce airborne radiation levels in containment

QUESTION: 082 (2.00)

LIST ALL the automatic actions that occur on receipt of a REFUEL FLOOR WALL EXHAUST HI-HI RADIATION alarm. (2.0)

QUESTION: 083 (1.00)

WHICH ONE (1) of the following poses the greatest biological threat to the general public during a high off-site radiation release with core damage?

a. Xe-135

b. Kr-85

c. I-131

d. He-4

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

ANSWER: 001 (1.00)

c.

REFERENCE:

1. AD-QA-103 page 24.
2. Shift Supervison Task #02004: Review Tagging requests for plant equipment

K/A 294001 K1.02 (3.9/4.5)

294001K102 ..(KA's)

ANSWER: 002 (1.00)

b.

REFERENCE:

1. AD-QA-103, Protective Permit and Tag System, pg 11
2. AD-QA-302, System Status and Equipment Control, pg 8
3. AD044: Administrative Procedures and Operations Instructions - Specific Objective XV.B.2.f

K/A 294001 K1.02 (3.9/4.5)

294001K102 ..(KA's)

ANSWER: 003 (2.50)

*ANSWER

a. 3 d. 7
b. 3 e. 5
c. 2 (0.5 each)

REFERENCE:

*REFERENCE
1. Conduct of Operation (AD-QA-300), page 47.

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective VII.B.2.d

K/A 294001 K1.01 (3.7/3.7)
294001K101 ..(KA's)

ANSWER: 004 (2.00)

a. 4160 VAC and above.

b. 1. Equipment check (in accordance with applicable procedures). (0.5)

2. General area inspection (to ensure no personnel safety hazards exist). (0.5)

3. Notification of other Unit control room of the evolution to be performed. (0.5)

REFERENCE:

1. Conduct of Operations, AD-QA-300 page 55.

2. Shift Supervison Task #01014: Direct shift personnel actions during major plant evolutions

3. AD044: Administrative Procedures and Operations Instructions - Specific Objective VII.B.3.d

K/A 294001 K1.07 (3.3/3.6)

294001K107 ..(KA's)

ANSWER: 005 (1.00)

b.

REFERENCE:

1. Fire Watch Procedure (AD-QA-143) page 8.

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective XXI.B.6

K/A 294001 K1.16 (3.5/3.8)

294001K116 ..(KA's)

ANSWER: 006 (1.00)

c.

REFERENCE:

1. Hydrogen Storage System, OP-074-001.

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective XXII.B.1 (AD-QA-140, Use and Storage of Combustible/Hazardous Materials, not supplied to NRC)

K/A 294001 K1.15 (3.4/3.8)

294001K115 ..(KA's)

ANSWER: 007 (1.00)

*ANSWER

d.

REFERENCE:

*REFERENCE
1. AD-00-705, Access Control and Radiation Work Permit System, pg 16

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective VI.B.4

K/A 294001 K1.03 (3.3/3.8)
294001K103 ..(KA's)

ANSWER: 008 (1.00)

*ANSWER

c.

REFERENCE:

*REFERENCE
1. ON-178-002, Core Flux Oscillations, pg 2

2. ON-164-002, Loss of Reactor Recirculation Flow, pg 3

3. GO-100-009, Single Recirculation Loop Operation, Attachment A

4. AD045: Off-Normal Procedures - Terminal Unit Objective

K/As 295001 A2.01 (3.8) 295001 SG.10 (3.7)
295001 SG.11 (4.2)
295001A201 295001G010 295001G011 ..(KA's)

ANSWER: 009 (1.00)

d.

REFERENCE:

1. ON-178-002, Core Flux Oscillations, pgs 4 and 5

2. AD045: Off-Normal Procedures - Specific Objective 1

K/As 295001 K1.03 (4.1) 295001 K1.02 (3.5)
295001 SG.04 (3.7)

295001G004 295001K102 295001K103 ..(KA's)

ANSWER: 010 (1.00)

b.

REFERENCE:

1. SY017 A-5: Licensed Operator System Generator Stator Cooling (Level III), pg 4 - Specific Objective 3

2. ON-197-001, Loss of Stator Cooling, pg 3

K/As 295005 SG.5 (3.6) 295005 SG.11 (4.1)
295018 SG.5 (3.5) 295018 SG.11 (4.1)

295005G005 295005G011 295018G005 295018G011 ..(KA's)

ANSWER: 011 (1.00)

c.

REFERENCE:

1. SY017 M-1: Emergency Service Water - Terminal Unit Objective

2. ON-054-001, Loss of Emergency Service Water, pg 5

3. OP-054-001, Emergency Service Water System, pg 5

K/As 295018 K2.02 (3.6) 295018 SG.04 (3.5)

295018G004 295018K202 ..(KA's)

ANSWER: 012 (1.00)

d.

REFERENCE:

1. ON-155-007, Loss of CRD System Flow, page 2.

K/As 295022 SG.10 (3.5)

295022G010 ..(KA's)

ANSWER: 013 (1.00)

a.

REFERENCE:

1. ON-118-001, Loss of Instrument Air, pg 4
2. AD045: Off-Normal Procedures - Specific Objective 3

K/As 295019 K2.01 (3.9) 295019 SG.04 (3.6)

295019G004 295019K201 ..(KA's)

ANSWER: 014 (1.00)

b.

REFERENCE:

1. SSES Technical Specifications, page B 3/4 9-2

K/As 295023 K1.01 (3.6/4.1) 295023 SG.04 (2.7/3.8)

295023G004 295023K101 ..(KA's)

ANSWER: 015 (1.00)

d.

REFERENCE:

1. ON-149-001, Loss of RHR Shutdown Cooling Mode, pgs 3 and 4
2. Shift Supervision Task #04010: Direct actions to ensure that core cooling and the Shutdown Margin are maintained during an abnormal or emergency event.

K/As 295021 A1.04 (3.7) 295021 SG.10 (3.3)

295021A104 295021G010 ..(KA's)

ANSWER: 016 (1.00)

d.

REFERENCE:

1. EO-100-030, Unit 1 Response to Station Blackout, pages 4 and 5.
2. SM001C: Event Based EOPs - Specific Objective 2.c

K/As 295003 K1.06 (3.8/4.0) 295003 A1.03 (4.4/4.4)

295003A103 295003K106 ..(KA's)

ANSWER: 017 (1.00)

a.

REFERENCE:

1. EO-100-009, Plant Shutdown from Outside the Control Room, page 2.
2. SM001C: Event Based EOPs - Specific Objective 1.e

K/As 295016 SG.10 (3.8/3.6)

295016G010 ..(KA's)

ANSWER: 018 (1.00)

b.

REFERENCE:

1. EO-100-009, Plant Shutdown from Outside the Control Room, pages 40, 41.

2. SM001C: Event Based EOPs - Specific Objective 1.a

K/As 295016 K3.03 (3.5/3.7)

295016K303 ..(KA's)

ANSWER: 019 (2.00)

a. 2
b. 6
c. 5
d. 4 (0.5 each)

REFERENCE:

1. ON-143-001, Loss of Main Condenser Vacuum, page 2

2. SY017 A-1: Main Trubine Construction - Specific Objective 17

K/As 295002 K2.02 (3.1/3.2) 295002 K2.03 (3.5/3.6)
295002 K2.04 (3.2/3.3)

295002K202 295002K203 295002K204 ..(KA's)

ANSWER: 020 (1.00)

d.

REFERENCE:

1. EO-100-101, Scram Bases, pg 7

2. PP002A: Emergency Operating Procedures - Specific Objective 19

K/As 295005 K2.08 (3.3) 295005 SG.07 (3.3)

295005G007 295005K208 ..(KA's)

ANSWER: 021 (2.00)

1. Scram the reactor (~~0.5~~ 1.0 c)
2. (Runback Recirc or Reduce Recirc speed to minimum ~~(0.5)~~ c)
3. (Trip both Recirc pumps ~~(0.5)~~ c)
4. Isolate the MSIVs and MSL drains (~~0.5~~ 1.0) c
   (Inject SLC before suppression pool temperature > 110^F)

OR

1. AND 4. AS CORRECT ANSWER

REFERENCE:

1. AD-QA-300, Attachment D, Immediate Operator Actions

2. PP002A: Emergency Operating Procedures - Specific Objective 23

K/As 295037 SG.10 (3.8) 295037 SG.11 (4.7)
295006 SG.10 (4.2) 295006 SG.11 (4.5)

295006G010 295006G011 295037G010 295037G011 ..(KA's)

ANSWER: 022 (1.00)

b.

REFERENCE:

1. EO-100-100, Caution and Note Bases, pg 5

2. PP002A: Emergency Operating Procedures - Specific Objective 2

K/As 295026 SG.07 (3.4/3.8)

295026G007 ..(KA's)

ANSWER: 023 (1.00)

*ANSWER

d.

REFERENCE:

*REFERENCE
1. EO-100-112, Rapid Depressurization Bases, pg 4

2. PP002A: Emergency Operating Procedures - Specific Objective 5.b

K/As 295030 K2.08 (3.8)
295030K208 ..(KA's)

ANSWER: 024 (1.00)

c.

REFERENCE:

1. EO-100-103, Primary Containment Control, pg 17

2. PP002A: Emergency Operating Procedures - Specific Objective 19

K/As 295024 K2.18 (3.4) 295024 SG.04 (4.1)

295024G004 295024K218 ..(KA's)

ANSWER: 025 (1.00)

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c.

REFERENCE:

1. EO-100-104, Secondary Containment Control, flowchart

2. PP002A: Emergency Operating Procedures - Specific Objective 14

K/As 295033 SG.11 (4.5) 295033 SG.12 (4.4)

295033G011 ..(KA's)

ANSWER: 026 (1.00)

c.

REFERENCE:

SY017 A-8 pages 1 - 24.
SY017 A-8 Learning Objective 8.b
K/As 241000 K3.01 (4.1/4.1) 241000 K3.02 (4.2/4.3)
241000 K3.06 (4.1/4.1)

241000K301 241000K302 241000K306 ..(KA's)

ANSWER: 027 (3.00)

*ANSWER
a. 3, 4, 5, 6 (0.125 each)
b. 7 (NONE) (0.5)
c. 2, 3, 5 (0.167 each)
d. 1 (0.5)
e. 1, 4 (0.25 each)
f. 7 (NONE) (0.5)

REFERENCE:

*REFERENCE
1. SY017 E-3: Primary Containment Isolation, Table 1 - Specific Objective 5

K/As 223002 K1.01 (3.9) 223002 K1.08 (3.5) 223002 K1.06 (3.2)
223002 K1.10 (3.2) 223002 A1.02 (3.7)
223002K101 223002K106 223002K108 223002K110 ..(KA's)

ANSWER: 028 (1.00)

*ANSWER

b.

REFERENCE:

*REFERENCE
SY017 Learning Objective #6.
SY017 G-1, page 29-30.
K/A 264000 K4.02 (4.0/4.2)
264000K402 ..(KA's)

ANSWER: 029 (1.00)

a.

REFERENCE:

SY017 K-2 Learning Objective 10.f
SY017 K-2, page 28.
K/A 201001 K6.03 (3.0/2.9) 295019 K2.01 (3.8/3.9)

201001K603 295019K201 ..(KA's)

ANSWER: 030 (1.00)

*ANSWER

d. or c

REFERENCE:

*REFERENCE
SY017 K-2, 10.c
SY017 K-2 page 21.
K/A 212000 K6.04 (2.8/3.1)
295004 K2.03 (3.3/3.3)
212000K604 295004K203 ..(KA's)

ANSWER: 031 (1.00)

d.

REFERENCE:

SY017 pages 11 and 15.
K/A 239002 A1.01 (3.3/3.4)

218000A101 239002A101 ..(KA's)

ANSWER: 032 (1.00)

a.

REFERENCE:

1. SYO10 C-4:Automatic Depressurization System, pages 7 and 13 - Specific Objective 9d

K/As 218000 A2.06 (4.2/4.3) 218000 A4.03 (4.2/4.2)

218000A206 218000A403 ..(KA's)

ANSWER: 033 (1.00)

*ANSWER

b.

REFERENCE:

*REFERENCE
OP-150-001 Revision 9, page 9.
SY017 C-5 Learning Objective 10.
K/A 217000 K5.06 (2.7/2.7) 217000 K4.04 (3.0/3.1)
217000K404 217000K506 ..(KA's)

ANSWER: 034 (1.00)

b.

REFERENCE:

1. SOER 82-8, Auxiliary Feedwater Pump Turbine Trip and Throttle Valve Indication

2. SY017 C-5: Reactor Core Isolation Cooling System, Events pg 2 - Specific Objective 11

K/As 217000 A4.02 (3.9/3.9)

217000A402 ..(KA's)

ANSWER: 035 (1.00)

b.

REFERENCE:

SY017 D-3 Learning Objective #7.
SY017 D-3 page 40.
K/As 202001 K1.19 (3.2/3.2) 202001 K1.22 (3.5/3.6)
202001 K4.02 (3.1/3.2) 202002 K6.05 (3.1/3.1)
202002 K1.08 (3.1/3.2) 202002 K4.06 (3.1/3.1)

202001K119 202001K122 202001K402 202002K605 ..(KA's)

ANSWER: 036 (1.00)

c.

REFERENCE:

SY017 L-8 page 41.
SY017 Learning Objective, (not covered).
K/As 202001 A1.02 (3.4/3.4) 202001 A1.03 (3.6/3.6)
202001 A4.04 (3.7/3.7)

202001A102 202001A103 202001A404 ..(KA's)

ANSWER: 037 (1.00)

c.

REFERENCE:

SY017 L-8 page 8.
SY017 Learning Objectives #9.
K/As 202001 A1.09 (3.3/3.3) 202001 A4.11 (3.2/3.3)

202001A109 202001A411 ..(KA's)

ANSWER: 038 (1.00)

d.

REFERENCE:

SY017 D-3 page 41
GO-100-002 Revision 11, page 24.
SY017 D-3 Learning Objective 8.b
K/As 259001 K3.01 (3.9/3.9) 259001 K6.01 (3.0/3.0)

259001K301 259001K601 ..(KA's)

ANSWER: 039 (1.00)

d.

REFERENCE:

SY017 D-3 pages 30-32, 39.
SY017 D-3 Learning Objective 8.c
K/As 259002 K6.03 (3.1/3.1) 259002 K3.01 (3.8/3.8)

259002K301 259002K603 ..(KA's)

ANSWER: 040 (1.00)

c.

REFERENCE:

SY017 I-2 page 17.
SY017 I-2 Learning Objective #3.
K/As 215003 K4.01 (3.7/3.7) 215003 K4.02 (4.0/4.0)

215003K401 215003K402 ..(KA's)

ANSWER: 041 (1.00)

b.

REFERENCE:

SY017 I-4 page 19.
AR-103-001 page 15.
SY017 I-4 Learning Objectives #2.
K/As 215005 K4.01 (3.7/3.7) 215005 K4.02 (4.1/4.2)
215005 SG.08 (3.6/3.6)

215005G008 215005K401 215005K402 ..(KA's)

ANSWER: 042 (1.00)

c.

REFERENCE:

SY017 I-4 page 13.
SY017 I-4 Learning Objective #6.
K/As 215005 K1.04 (3.6/3.6) 215005 A4.03 (3.2/3.3)

215005A403 215005K104 ..(KA's)

ANSWER: 043 (1.00)

c.

REFERENCE:

1. SY017 I-5: Traversing In-Core Probe System, page 21 - Specific Objective 5

K/As 215001 K4.01 (3.4/3.5) 215001 A2.01 (2.7/2.9)

215001A201 215001K401 ..(KA's)

ANSWER: 044 (1.00)

b.

REFERENCE:

1. SY017 J-1: Reactor Vessel and Internals, pages 20, 24 and 25 - Specific Objective 5

K/As 290002 K4.03 (3.2/3.3)

290002K403 ..(KA's)

ANSWER: 045 (1.00)

*ANSWER

d.

REFERENCE:

*REFERENCE
1. SY017 D-1: Condensate and Condensate Demineralizers, page 19 - Specific Objective 4

K/As 256000 K4.01 (3.4/3.4) 256000 A2.10 (3.1/3.1)
256000A210 256000K401 ..(KA's)

ANSWER: 046 (1.00)

c.

REFERENCE:

1. SY017 F-2: Off Gas Recombiner, pages 10 and 11 - Specific Objective 6.b

K/As 271000 A1.08 (3.1/3.1) 271000 K4.08 (3.1/3.3)
271000 A4.06 (3.3/3.2) 271000 A4.09 (3.3/3.2)

271000A108 271000A406 271000A409 271000K408 ..(KA's)

ANSWER: 047 (1.00)

b.

REFERENCE:

SY017 K-6 page 8.
SY017 K-6 Learning Objective #9.
K/As 201006 A1.02 (3.4/3.6) 201006 K5.10 (3.2/3.3)

201006A102 201006K510 ..(KA's)

ANSWER: 048 (1.00)

a.

REFERENCE:

SY017 K-6 page 17.
SY017 K-6 Learning Objectives #8 & #9.
K/As 201006 A1.01 (3.2/3.3) 201006 A1.02 (3.4/3.5)

201006A101 201006A102 ..(KA's)

ANSWER: 049 (1.00)

c.

REFERENCE:

SY017 Learning Objective #3.
SY017 I-1 page 29.
K/A 215004 K4.01 (3.7/3.7)

215004K401 ..(KA's)

ANSWER: 050 (1.00)

c.

REFERENCE:

1. RE-081-032, Refueling Operations, page 7

K/As 234000 A4.01 (3.7/3.9)
215004 A4.07 (3.4/3.6)

215004A407 234000A401 ..(KA's)

ANSWER: 051 (1.00)

c.

REFERENCE:

1. SY017 M-2: Fuel Handling Systems, pages 19 and 20 - Specific Objective 12.a

K/As 234000 K5.02 (3.1/3.7)

234000K502 ..(KA's)

ANSWER: 052 (1.00)

*ANSWER

a.

REFERENCE:

*REFERENCE
1. SY017 E-2: Secondary Containment, pages 10 and 11 - Specific Objectives 6 and 8

2. SY017 L-3: Standby Gas Treatment System, pages 11 and 27 - Specific Objective 5

K/As 261000 K4.01 (3.7/3.8) 261000 A2.10 (3.1/3.2)
290001 A3.01 (3.9/4.0)
261000A210 261000K401 290001A301 ..(KA's)

ANSWER: 053 (1.00)

c.

REFERENCE:

SY017 C-1 page 2 and 3 (Attachment D)
SY017 C-1 Learning Objective #8.
K/As 205000 K4.04 (2.6/2.6) 205000 K6.04 (3.6/3.6)

205000K404 205000K604 ..(KA's)

ANSWER: 054 (1.00)

a.

REFERENCE:

1. SY017 C-1: Residual Heat Removal, Attachment D, page 2 and Event 1, page 2 - Specific Learning Objectives 9 and 16.

2. OP-149-002, RHR Operation in Shutdown Cooling Mode, page 7

K/As 205000 K4.03 (3.8/3.8) 205000 SG.10 (3.2/3.3)

205000G010 205000K403 ..(KA's)

ANSWER: 055 (1.00)

b.

REFERENCE:

1. SY017 C-1: Residual Heat Removal, page 6 of Attachment A, page 2 of Attachment B, Pages 1 and 2 of Attachment C - Specific Objectives 5, 8, and 9

2. OP-149-001, RHR System, page 11

3. OP-149-005, RHR Operation in Suppression Pool Cooling Mode, page 7

K/As 219000 A2.14 (4.1/4.3) 219000 K4.03 (3.8/3.8)
219000 A1.08 (3.7/3.6) 203000 K4.10 (3.9/4.1)
203000 A3.01 (3.8/3.7)

203000K410 219000A108 219000A214 219000K403 ..(KA's)

ANSWER: 056 (3.00)

a.	2	(0.5)	d.	5	(0.5)
b.	3	(0.5)	e.	3	(0.5)
c.	1, 2	(0.25 each)	f.	1	(0.5)

REFERENCE:

295024G011 4.3/4.5
295026G011 4.4/4.6
295034G011 4.2/4.3
295032G011 4.1/4.2

1. PPOO2A: Emergency Operating Procedures - Sepcific Objective 17
295024G011 295026G011 295032G011 295034G011 ..(KA's)

ANSWER: 057 (2.00)

a.	2	d.	3
b.	2		
c.	1		(0.50 each)

REFERENCE:

1. AD-00-705, Access Control and Radiation Work Permit System

2. AD044: Administrative Procedures and Operations Instructions - Specific Objective VI.B.2

K/A 294001 K1.03 (3.3/3.8)
294001K103 ..(KA's)

ANSWER: 058 (1.00)

*ANSWER

d.

REFERENCE:

*REFERENCE
294001K103 3.3/3.8
External Dosimetry Program, AD-00-735 Revision 12, page 7.
294001K103 ..(KA's)

ANSWER: 059 (1.00)

d.

REFERENCE:

294001A113 4.5/4.3
AD-QA-300 page 42.
294001A113 ..(KA's)

ANSWER: 060 (1.00)

d.

REFERENCE:

217000K601 3.4/3.5
SY017 C-5 Learning Objectives #4.
SY017 C-5 pages 10-13.
217000K601 ..(KA's)

ANSWER: 061 (1.00)

a.

REFERENCE:

259002K605 3.5/3.5
Reactor Feedwater System, SY017 D-3 pages 30-32, 39.
Reactor Feedwater System, SY017 D-3 Learning Objective 8.a
259002K605 ..(KA's)

ANSWER: 062 (1.00)

a.

REFERENCE:

211000K301 4.3/4.4
Standby Liquid Control, SY017 C-3 page 10
Standby Liquid Control, SY017 C-3 Learning Objective #11.
Boron Injection Using RCIC system, ES-150-002
211000K301 ..(KA's)

ANSWER: 063 (1.00)

b.

REFERENCE:

211000K506 3.0/3.2
Standby Liquid Control, SL017 C-3 page 3 and 4.
Standby Liquid Control, SL017 C-3 Learning Objective 5.
211000K506 ..(KA's)

ANSWER: 064 (1.00)

a.

REFERENCE:

215005K101 4.0/4.0
215005K102 3.7/3.7
215005K103 3.4/3.5
Average Power Range Monitor, SY017 I-4 page 3.
Reactor Protection System, SY017 L-5 Figure 13.
Average Power Range Monitor, SY017 I-4 Learning Objective 2.
215005K101 215005K102 215005K103 ..(KA's)

ANSWER: 065 (1.00)

c.

REFERENCE:

215003A401 3.3/3.3
Intermediate Range Monitor, SY017 I-2 page 14.
Reactor Operator Task #21529: Conduct IRM-APRM Instrument Range Overlap Check
215003A401 ..(KA's)

ANSWER: 066 (1.00)

*ANSWER

a.

REFERENCE:

*REFERENCE
241000K302 4.2/4.3
EHC Pressure Control and Logic, SY017 A-8 page 7.
EHC Pressure Control and Logic, SY017 A-8 Learning Objective 8.b
241000K302 ..(KA's)

ANSWER: 067 (3.00)

*ANSWER

a. 1
b. 4
c. 6
d. 2
e. 4 (0.5 each)
f. 4

REFERENCE:

*REFERENCE
216000K101 3.9/4.1
216000K102 3.8/4.0
216000K102 3.8/4.0
216000K112 3.6/3.7
Reactor Vessel Instrumentation, SY017 J-2 pages 10 through 15.
Reactor Vessel Instrumentation, SY017 J-2 Learning Objective #4.
216000K101 216000K102 216000K112 ..(KA's)

ANSWER: 068 (1.00)

a.

REFERENCE:

263000A101 2.5/2.8
DC Distribution 125 V,SY017 G-3 page 1.
DC Distribution 125 V,SY017 G-3 Learning Objective #3.
263000A101 ..(KA's)

ANSWER: 069 (1.00)

d.

REFERENCE:

201006G004 3.4/3.4
Rod Worth Minimizer, SY017 K-6 page 1.
Rod Worth Minimizer, SY017 K-6 Learning Objective #1.
201006G004 ..(KA's)

ANSWER: 070 (1.00)

d.

REFERENCE:

218000A104 4.1/4.2
Automatic Depressurization System, SY017 C-4 Learning Objectives, #1
Automatic Depressurization System, SY017 C-4 page 3.
218000A104 ..(KA's)

ANSWER: 071 (1.00)

d.

REFERENCE:

219000K301 3.9/4.1
Residual Heat Removal, SY017 C-1 page 6.
Residual Heat Removal, SY017 C-1 Learning Objective #1.
219000K301 ..(KA's)

ANSWER: 072 (2.50)

a. Low recombiner inlet temperature 225 degrees (+/- 10 deg)
High-High recombiner discharge temp 925 degrees (+/- 10 deg)
Recombiner condenser cooling water flow low 275 gpm (+/- 25 gpm)
Motive steam jet condenser cooling water flow low 110 gpm (+/- 25 gpm)
(0.25 for each signal, 0.25 for each setpoint)

b. Hydrogen concentration high-high (0.5)

REFERENCE:

271000K504 2.9/3.1
271000K404 3.3/3.6
271000K405 2.6/2.6
271000K408 3.1/3.3
Off Gas Recombiner SY017 F-2 page 13.
Off Gas Recombiner SY017 F-2 Learning Objective #8.

271000K404 271000K405 271000K408 271000K504 ..(KA's)

ANSWER: 073 (1.50)

(0.5 each)
Manual switch (on 1C651)
Peripheral rod selected
Reference APRM less than 30%
NO ROD SELECTED

REFERENCE:

215002K101 2.9/3.0
215002K103 3.2/3.2
Rod Block Monitor, SY017 K5 page 9.
Rod Block Monitor, SY017 K5 Learning Objectives #6.
215002K101 215002K103 ..(KA's)

ANSWER: 074 (1.00)

b.

REFERENCE:

215002K104 3.1/3.1
Rod Block Monitoring System, SY017 K5 page 7 and 8.
Rod Block Monitoring System, SY017 K5 Learning Objective #3.
215002K104 ..(KA's)

ANSWER: 075 (1.00)

d.

REFERENCE:

295009K201 3.9/4.0
Reactor Feedwater system (SY017 D-3) Figure 13.
Reactor Vessel Instrumentation (SY017 J-2), Figure 6.
Reactor Vessel Instrumentation (SY017 J-2) Learning Objective #4, #7.
295009K201 ..(KA's)

ANSWER: 076 (1.00)

a.

REFERENCE:

295001A101 3.5/3.6
ON-164-002, Loss of Reactor Recirculation Flow page 3.
295001A101 ..(KA's)

ANSWER: 077 (2.50)

a. (0.5 each)
Suction valve
Discharge valve
Discharge bypass valve

b. The suction valve limiting design rating is 50 psid (0.5). When a dual seal failure occurs, greater than 50 psid would develop across the partially closed suction valve if the pump discharge had been isolated first (0.5).

REFERENCE:

295001K303 2.8/2.9
295001A101 3.5/3.6
ON-164-003 Reactor Recirculation Pump Dual seal Failure page 4.
295001A101 295001K303 ..(KA's)

ANSWER: 078 (1.00)

c.

REFERENCE:

295005K302 3.4/3.5
ON-193-002, Main Turbine Trip, page 3.
295005K302 ..(KA's)

ANSWER: 079 (1.00)

c.

REFERENCE:

295023K102 3.2/3.6
SSES Technical Specifications page 1-7.
295023K102 ..(KA's)

ANSWER: 080 (2.00)

*ANSWER
1. d.

2. Sprargers submerged above 47'.

REFERENCE:

*REFERENCE
295024K302 3.5/3.8
Primary Containment Control EO-100-103, page 18.
EOP Learning Objectives # 19.
295024K302 ..(KA's)

ANSWER: 081 (1.00)

c.

REFERENCE:

295035K202 3.6/3.8
Secondary Containment Control, EO-100-104
Secondary Containment Control Bases, EO-100-104 page 4.
EOP Learning Objectives #19.
295035K202 ..(KA's)

ANSWER: 082 (2.00)

(0.5 each)
1. Reactor Building HVAC Zone III Ventilation isolates

2. Reactor Building HVAC Recirculation Ventilation starts (and commences recirculation of Zone III)

3. SBGT starts

4. Control Room Emergency Outside Air System starts

REFERENCE:

295033K202 3.8/4.1
295033K203 3.7/3.9
295033K204 3.9/4.2
Abnormal Radiation Release-Gaseous (ON-070-001) page 3.
Area Radiation Monitoring System SY017 Learning Objective #5.
295033K202 295033K203 295033K204 ..(KA's)

ANSWER: 083 (1.00)

c.

REFERENCE:

295038K102 4.2/4.4
SSES Technical Specifications 3/4.4.5
10 CFR 100
295038K102 ..(KA's)

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

QUESTION	VALUE	REFERENCE
001	1.00	9000001
002	1.00	9000002
003	2.50	9000003
004	2.00	9000004
005	1.00	9000005
006	1.00	9000006
007	1.00	9000007
008	1.00	9000016
009	1.00	9000017
010	1.00	9000018
011	1.00	9000019
012	1.00	9000020
013	1.00	9000021
014	1.00	9000022
015	1.00	9000023
016	1.00	9000026
017	1.00	9000027
018	1.00	9000028
019	2.00	9000029
020	1.00	9000030
021	2.00	9000031
022	1.00	9000033
023	1.00	9000034
024	1.00	9000036
~~025~~	~~1.00~~	~~9000037~~ C DELETED
026	1.00	9000052
027	3.00	9000053
028	1.00	9000054
029	1.00	9000055
030	1.00	9000056
031	1.00	9000057
032	1.00	9000058
033	1.00	9000059
034	1.00	9000060
035	1.00	9000061
036	1.00	9000062
037	1.00	9000063
038	1.00	9000064
039	1.00	9000065
040	1.00	9000068
041	1.00	9000069
042	1.00	9000070
043	1.00	9000071
044	1.00	9000072
045	1.00	9000073
046	1.00	9000074
047	1.00	9000075
048	1.00	9000076
049	1.00	9000077
050	1.00	9000078
051	1.00	9000079
052	1.00	9000080
053	1.00	9000081
054	1.00	9000082

QUESTION	VALUE	REFERENCE
055	1.00	9000083
056	3.00	9000098
057	2.00	9000086
058	1.00	9000112
059	1.00	9000113
060	1.00	9000097
061	1.00	9000099
062	1.00	9000100
063	1.00	9000101
064	1.00	9000102
065	1.00	9000103
066	1.00	9000104
067	3.00	9000105
068	1.00	9000106
069	1.00	9000107
070	1.00	9000096
071	1.00	9000108
072	2.50	9000109
073	1.50	9000110
074	1.00	9000111
075	1.00	9000087
076	1.00	9000090
077	2.50	9000093
078	1.00	9000088
079	1.00	9000094
080	2.00	9000089
081	1.00	9000095
082	2.00	9000092
083	1.00	9000091

99.0	~~100.00~~ C	

99.0	~~100.00~~ C	

ATTACHMENT 3
Facility Comments on Written Examination

PP&L Pennsylvania Power & Light Company
P.O. Box 467 • Berwick, PA 18603-0467 • 717/542-3350

Susquehanna
Training Center

April 12, 1990

Mr. R.M. Gallo
U.S. N.R.C.
475 Allendale Rd.
King of Prussia, PA 19406

Susquehanna Training Center
Replacement License Exam
PLA 3382 File A14-2C

Dear Mr Gallo,

Region 1 examiners conducted a replacement license exam at Susquehanna the week of April 9, 1990. We think the exams were well written and well run by your staff.

The following general comments are offered for your consideration in preparing future exams:

1. Underline and capitalize the word NOT when it is used in a question.
2. In several cases, the learning objective referenced for a question had little to do with the question.
3. Some Emergency Operating Procedure questions required the candidate to remember specific follow-up actions and their positions in the flow charts. We believe these questions should provide the flow chart or be rewritten in some manner which does not require recall of the flow chart decision loops and steps.
4. Some questions reference facility learning objectives which clearly state that the student should be given the applicable procedure to perform the objective. The exam did not provide those procedures.

Specific comments are provided in Attachment A.

H.G. Stanley
Superintendent of Plant - SSES

Response: No

cc: J.A. Blakeslee
W.H. Lowthert
T.R. Markowski
H.J. Palmer
R.M. Peal
R. J.Conte
T.A. Easlick
NTG File
SRMS:DCC-Site

Attachment

RMP/pld001i

HGS'RMP/mja

QUESTION: 010 (1.00)

Unit 1 is operating at 85% power and experiences a problem with the Main Generator Stator Water Cooling system. Conditions are as follows:

"A" Stator Water Cooling Pump	-	Tripped
"B" Stator Water Cooling Pump	-	Running
Stator Cooling outlet temperature	-	79 degrees Celsius
Stator Cooling water inlet pressure	-	10 psig
Stator Cooling Tank level	-	10" below normal and decreasing

SELECT the ONE correct statement from those below.

a. The load on the Main Generator must be reduced below 24% in 70 seconds or the main turbine will trip.

b. The main turbine will automatically trip 70 seconds after the Stator Cooling water inlet pressure dropped below 13 psig.

c. The main turbine will automatically trip 70 seconds after the Stator Cooling outlet temperature reached 75 degrees Celsius.

d. The main turbine will automatically trip if the "B" Stator Water Cooling Pump trips after a 70 second time delay.

ANSWER: 010 (1.00)

b.

REFERENCE:

1. SY017 A-5: Licensed Operator System Generator Stator Cooling (Level III), pg 4 - Specific Objective 3

2. ON-197-001, Loss of Stator Cooling, pg 3

K/As 295005 SG.5 (3.6) 295005 SG.11 (4.1)
295018 SG.5 (3.5) 295018 SG.11 (4.1)

295005G005 295005G011 295018G005 295018G011 ..(KA's)

FACILITY COMMENT:

The answer given is (b), but the plant setpoint was recently changed from 13 psig to 44 psig. Alternative (c) is 75°C while the actual plant trip is 79°C. Alternative (c) is closer to correct then (b), but some candidates picked (b) assuming the test was written before the setpoint changed.

Accept either (b) or (c) for full credit.

REFERENCE:

ON-197-001 Rev. 3

QUESTION: 021 (2.00)

Unit 2 is operating at 87% power. Main Steam Line radiation levels are 9 times Normal Full Power Background (NFPB) and increasing. No automatic actions have occurred.

STATE ALL the immediate operator actions required.

ANSWER: 021 (2.00)

1. Scram the reactor (0.5)
2. Runback Recirc or Reduce Recirc speed to minimum (0.5)
3. Trip both Recirc pumps (0.5)
4. Isolate the MSIVs and MSL drains (0.5)
   (Inject SLC before suppression pool temperature >110°F)

REFERENCE:

1. AD-QA-300, Attachment D, Immediate Operator Actions

2. PP002A: Emergency Operating Procedures - Specific Objective 23

K/As 295037 SG.10 (3.8) 295037 SG.11 (4.7)
295006 SG.10 (4.2) 295006 SG.11 (4.5)

295006G010 295006G011 295037G010 295037G011 ..(KA's)

FACILITY COMMENT:

Change the answer to read:

or

1 and 4 (without the statement in parenthesis) for a correct answer.

The change made in the exam review reflects the fact that the candidate may assume the manual scram (step 1) is successful. If it si, steps 2 and 3 are not applicable, and neither is the part of step 4 in parenthesis.

QUESTION: 025 (1.00)

WHICH ONE (1) of the following conditions would require a reactor scram in accordance with EO-100-004, "Secondary Containment Control?"

a. An area radiation level exceeds the "Max Normal" level.

b. An area radiation level exceeds ten times the alarm level.

c. An area radiation level exceeds ten times the "Max Normal" level.

d. A primary system required to shutdown the reactor discharging into an area resulting in area radiation levels above the "max Normal" level.

ANSWER: 025 (1.00)

c.

REFERENCE:

1. EO-100-104, Secondary Containment Control, flowchart

2. PP002A: Emergency Operating Procedures - Specific Objective 14

K/As 295033 SG.11 (4.5) 294033 SG.12 (4.4)

295033G011 ..(KA's)

FACILITY COMMENT:

The question is misleading. It requires memory of flow chart decision loops and follow-up steps, which is unreasonable.

One of the decision loops questions whether a primary system is discharging, and if the answer is "NO", you never get to the step which is being tested. For this reason, neither option (c) or (d) is completely correct.

Accept either (c) or (d) for full credit.

REFERENCE:

EO-100-104

QUESTION: 030 (1.00)

The reactor is operating at 75% power when 125 VDC panel 1D614 is deenergized. A reactor scram signal on Reactor Protective System channels "A" and "B" is then received.

WHICH ONE (1) of the following correctly describes the response of the Control Rod Hydraulic System?

a. Scram pilot valves energize to vent air header.

b. Scram pilot valves fail "as is".

c. Backup scram valves energize to vent air header.

d. Backup scram valves fail "as is."

ANSWER: 030 (1.00)

d.

REFERENCE:

SY017 K-2, 10.c
SY017 K-2 page 21
K/A 212000 K6.04 (2.8/3.1)
295004 K2.03 (3.3/3.3)

212000K604 295004K203 ..(KA's)

FACILITY COMMENT:

Answers (c) and (d) are partially correct. One back-up scram valve is powered from 1D614 and it will fail as is (d). The other back-up scram valve is powered from 1D624 and it will energize and vent the air header (c).

Accept either (c) or (d) for full credit.

REFERENCE:

Print MI-C72-22 sheet 12 (attached)

QUESTION: 047 (1.00)

All rods in Group 1 are fully inserted except rod 14-19, which is fully withdrawn. All rods in group 2 and 3 are fully withdrawn. All rods in group 4 are as position 42. All rods in group 5 through 9 are fully inserted. The Rod Worth Minimizer system has been initialized. Note: A list of the rod groups with the assigned rods, insert limits and withdraw limits is attached as Figure 2.

WHICH ONE (1) of the following rods will be displayed in the withdraw error window?

a. 14-19

b. 14-31

c. 18-23

d. 22-15

ANSWER: 047 (1.00)

b.

REFERENCE:

SY017 K-6 page 8
SY017 K-6 Learning Objective #9
K/As 201006 A1.02 (3.4/3.6) 201006 K5.10 (3.2/3.3)

201006A102 201006K510 ..(KA's)

FACILITY COMMENT:

We believe this question is unreasonable. It is well past the point where RSCS and RWM would have stopped the start-up, and it challenges the operator to remember and apply a logic sequence that he would not have to do at all, much less without help or references.

Delete the question.

QUESTION: 048 (1.00)

All rods in Group 1 are fully inserted except rod 14-19, which is fully withdrawn. All rods in group 2 and 3 are fully withdrawn. All rods in group 4 are at position 42. All rods in group 5 through 9 are fully inserted. The Rod Worth Minimizer system has been initialized. Note: A list of the rod groups with the assigned rods, insert limits and withdraw limits is attached as Figure 2.

WHICH ONE (1) of the following control rods can be moved?

a. 14-19

b. 14-35

c. 22-15

d. 22-31

ANSWER: 048 (1.00)

a.

REFERENCE:

SY017 K-6 page 17
SY017 K-6 Learning Objective #8 & #9
K/As 201006 A1.01 (3.2/3.3) 201006 A1.02 (3.4/3.5)

201006A101 201006A102 ..(KA's)

FACILITY COMMENT:

We believe this question is unreasonable. It is well past the point where RSCS and RWM would have stopped the start-up, and it challenges the operator to remember and apply a logic sequence that he would not have to do at all, much less without help or references.

Delete the question.

QUESTION: 058 (2.00)

For each of the operating activities in Column A, SELECT the action from Column B that is required in accordance with AD-QA-300, "Conduct of Operations." Items in Column B may be used once, more once or not at all.

COLUMN A (ACTIVITIES)	COLUMN B (ACTIONS)
a. Application of blocking on a non safety related system	1. Verification
b. Checking a locked open valve in a non safety related system during performance of a system checkoff list	2. Confirmation
c. Restoration of removed fuses in a non safety related system	3. System Test Verification
d. Clearing blocking on a safety related system in a Locked High Radiation Area	4. Independent Verification
	5. No action required

ANSWER: 058 (2.00)

a. 1
b. 4
c. 2
d. 3 (0.50 each)

REFERENCE:

1. AD-QA-300, Conduct of Operations, pgs 43 - 45
2. AD044: Administrative Procedures and Operations Instructions - Specific Objective VII.B.7

K/A 294001 K1.01 (3.7/3.7)

294001K102 ..(KA's)

FACILITY COMMENT:

Part D. answer 3 or 4 is correct. Accept (3) and/or (4) for full credit.

REFERENCE:

AD-QA-300, pages 43 - 45

QUESTION: 077 (1.00)

EO-104, "Secondary Containment Control," requires a rapid depressurization of the RPV if more than one area temperature exceeds the "Max Safe" value.

WHICH ONE (1) of the following statements does NOT correctly describe the basis for this step?

a. Beyond maximum safe operating temperature, continued operation of safety related systems is no longer assured.

b. Beyond maximum safe operating temperature, continued integrity of secondary containment is no longer assured.

c. RPV depressurization reduces the driving head and flow or primary systems that are discharging into primary containment.

d. PRV depressurization must be performed while SRVs and/or bypass valves are still operable.

ANSWER: 077 (1.00)

d.

REFERENCE:

1. EO-100-104, Secondary Containment Control, pg 9

2. PP002A: Emergency Operating Procedures - Specific Objective 19

K/A 295032 K3.01 (3.8)

295032K301 ..(KA's)

FACILITY COMMENT:

Response C. is incorrectly worded, it should day "discharging into secondary containment", therefore, response C. would also meet the criteria of NOT correctly describing the basis for the step.

Recommend accept response "C" or "D" and/or "C" and "D."

QUESTION: 085 (3.00)

A Refuel Floor Exhaust High High Radiation alarm and Control Room Emergency Outside Air Intake High High Radiation alarm have been received in the Control Room.

For EACH area listed in Column A, SELECT the item from Column B that describes the ventilation exhaust path for the area. The items in Column B may be used once, more than once or not at all.

COLUMN A (AREAS)	COLUMN B (EXHAUST PATHS)
a. Battery Room	1. Release via Reactor Building Vent
b. Control Room	2. Release via Turbine Building Vent
c. Railroad Access	3. Release via SGTS Vent
d. Access Control Area	4. Recirc through CREOASS
e. Decontamination Area (Chem Lab)	5. System Isolated and/or Fan(s) Tripped
f. SGTS Equipment Room	

ANSWER: 085 (3.00)

a. 3 b. 4 c. 3
d. 5 e. 5 f. 3

REFERENCE:

1. SY017 L-11: Control Structure HVAC, pages 3 and 4 - Specific Objectives 5 and 6
2. SY017 E-2: Secondary Containment - Specific Objectives 2 and 6

K/As 295017 K2.04 (3.1/3.3) 295017 K2.07 (3.2/3.4)
88000 K1.02 (3.4/3.4) 288000 A2.04 (3.7/3.8)

288000A204 288000K102 295017K204 295017K207 ..(KA's)

FACILITY COMMENT:

Item d, access control area, was taken by some candidates to mean access to the primary containment in the reactor building. Because of this, they answered (3).

Accept either (3) or (5) for the answer to part (d).

ATTACHMENT 4
NRC RESPONSE TO FACILITY COMMENTS

Question 10: Comment not accepted. The NRC was not notified of the plant setpoint change prior to administration of the examination. If applicants are trained on changes after the reference material is sent to the NRC, the changes should be made known to the NRC in advance. This problem was not identified by facility personnel during the pre-examination review. The applicants that asked about the setpoint change during the examination were told to assume the test was written before the setpoint changed. Item (c) is not a correct answer and, therefore, cannot be accepted for credit. This question will be modified to reflect the current setpoint before it is loaded into the Examination Question Bank.

Question 21: Comment noted. This item was resolved during the pre-examination review with facility personnel.

Question 25: Comment partially accepted. The objective of this question was discussed with facility personnel during the pre-examination review and the question was determined to be acceptable. The intent of the question was to evaluate the applicants' knowledge of the definition of "Max Normal" radiation level, rather than memory of specific procedural steps and decision loops. This question was deleted from the examination because it does not test the objective that it was intended to test. Item (c) is not a correct answer and, therefore, cannot be accepted for credit.

Question 30: Comment accepted. Full credit was given for item (c) or item (d). The reference material supplied by the facility did not clearly indicate the power supplies for the back-up scram valves. The stem of this question will be modified so that there is only one correct answer before this question is loaded into the Examination Question Bank.

Question 47: Comment not accepted. The objective of this question is to evaluate the applicant's understanding of a Rod Worth Minimizer (RWM) withdraw error. This corresponds to a facility learning objective which states "describe withdraw error." For an operator to understand the RWM withdraw error, he must understand the logic that the RWM uses to generate a withdraw error. There was no indication that the scenario confused the applicants. There were no questions from the applicants concerning this question during administration of the examination.

Question 48: Comment not accepted. The objective of this question is to evaluate the applicant's understanding of rod blocks imposed by the Rod Worth Minimizer (RWM). The corresponding facility learning objectives state "describe insert error" and "describe withdraw error." If an operator understands the RWM insert and withdraw errors, he should be able to apply that knowledge to determine when the RWM will impose rod blocks. There was no indication that the scenario confused the applicants. There were no questions from the applicants concerning this question during administration of the examination.

Question 58: Comment accepted. Answer(s) (3) and/or (4) were accepted for full credit for part d.

Question 77: Comment accepted. Item (c) or item (d) was accepted for full credit. The reference to primary containment was a typographical error. This error will be corrected before the examination is loaded onto to Examination Question Bank.

Question 85: Comment accepted. Answer (3) or (5) was accepted for full credit for part d. Part d will be clarified before the question is loaded onto the Examination Question Bank.

ATTACHMENT 5

SIMULATION FACILITY REPORT

Facility Licensee: Pennsylvania Power & Light Company
Susquehanna Units 1 & 2

Facility Docket Nos.: 50-387
50-388

Operating Tests Administered on: April 11-13, 1990

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of non-compliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

During the preparation and administration of the operating tests, the following items were observed:

ITEM	DESCRIPTION
RBM	The Rod Block Monitor upscale alarm annunciator did not clear after the RBM channel was bypassed.
Mn.Turb.	Main Turbine high vibration alarm repeatedly annunciated through the hour long scenario with no indication of an actual high vibration condition.