May 4, 2000

Mr. G. Rainey, President
PECO Nuclear
Nuclear Group Headquarters
Correspondence Control Desk
P. O. Box 195
Wayne, PA 19087-0195

SUBJECT: LIMERICK NUCLEAR GENERATING STATION REACTOR OPERATOR AND SENIOR REACTOR OPERATOR INITIAL EXAMINATION REPORT 05000352/2000-301 AND 05000353/2000-301

Dear Mr. Rainey:

This report transmits the results of the subject operator licensing examinations conducted by the NRC during the period of April 3 through 7, 2000. These examinations addressed areas important to public health and safety and were developed and administered using the guidelines of the "Examination Standards for Power Reactors" (NUREG-1021, Revision 8).

Based on the results of the examinations, six of seven Senior Reactor Operator (SRO) and all four Reactor Operator (RO) applicants passed all portions of the examinations. One SRO failed the written (retake) examination. The preliminary performance insights observed during the examination were discussed between Mr. P. Bissett and Mr. D. Malinoski on April 7, 2000. The final results were discussed during an exit meeting with Mr. M. Gallagher, and other members of your staff on April 20, 2000. No significant inspection findings were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

No reply to this letter is required, but should you have any questions regarding this examination, please contact me at 610-337-5183, or by E-mail at RJC@NRC.GOV.

Sincerely,

/RA/

Richard J. Conte, Chief
Operational Safety Branch
Division of Reactor Safety

Docket Nos. 05000352; 05000353

IE42

21) *PV:1.0

The following sequence of events occur from 100% power:

HR:MIN:SEC	
08:30:00	"A" Condensate Pump trips
08:45:00	"B" INBOARD MSIV fails closed
08:50:00	Main Generator Lockout
09:00:00	Drywell pressure reaches 1.68 psig

WHICH ONE of the following RPS scram signals was generated FIRST?

a. Low RPV level

b. High RPV pressure

c. High Drywell pressure

d. Turbine Control Valve fast closure

22) *PV:1.0

Unit 2 conditions are as follows:

- Reactor power is 16% and steady
- RPV level was deliberately lowered and stabilized at -56"
- Drywell pressure is 0.3 psig and steady
- RE HVAC Exhaust Vent Duct Rad level is 0.5 mr/hr

NONE of the expected NSSSS Group Isolations have occurred

WHICH ONE of the following NSSSS Group Isolations must be manually initiated?

a. VIIIA, Drywell Chilled Water and Recirc Pump Cooling Water Lines

b. VIIA, Primary Containment Instrument Gas (PCIG) Process Lines

c. VIB, Primary Containment Exhaust to REECE & N2 Block Valves

d. VIIIB, ECCS Process Lines, Suppression Pool Spray Valves

23) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 4
- RPV level is 78"

WHICH ONE of the following identifies instrument calibration condition and the current indicated level as compared to actual level for the "2A" PAM Wide Range Level Indicator?

	Calibration condition	Indicated level
a.	hot	higher than actual
b.	cold	higher than actual
c.	hot	lower than actual
d.	cold	lower than actual

24) PV:1.0

Unit 2 plant conditions are as follows

- Startup is in progress
- The Neutron Monitoring Overlap Surveillance Test is complete

SRMs are being retracted with the following conditions:

IRM CHANNEL	IRM RANGE
A	4
B	3
C	2
D	4
E	BYPASSED
F	3
G	5
H	3

While being retracted, the reading from the "2A" SRM drops to 90 cps.

WHICH ONE of the following describes the expected alarm and rod block response?

	SRM RETRACTED WHEN NOT PERMITTED alarm	Rod Block
a.	on	not enforced
b.	off	enforced
c.	on	enforced
d.	off	not enforced

25) *PV:1.0

Plant conditions are as follows:

- RPV level dropped to -30", then recovered +20"
- RPV pressure is 850 psig
- "A" RHR loop "INITIATION" pushbutton was armed and depressed
- "A" RHR Loop is Spraying the Drywell

RPV level suddenly drops to -200"

WHICH ONE of the following decribes the response of the "A" RHR loop?

a. Remains in Drywell Spray

b. Re-aligns and injects into RPV

c. "A" RHR pump remains running on minimum flow only

d. "A" RHR pump trips, then restarts in LPCI injection mode

26) *PV:1.0

Unit 1 conditions are as follows:

- 100% power

An instrument failure results in isolation of 10S205, H_2O_2 analyzer

WHICH ONE of the following describes the maximum time allowed to restore the analyzer to service before a plant shutdown is required?

a. 24 hours

b. 48 hours

c. 7 days

d. 30 days

27) *PV:1.0

Unit 2 plant conditions are as follows:

- A Reactor Startup is in progress
- Reactor power is 16%
- An EHC system failure caused all Turbine Bypass Valves to open
- The MSIVs automatically isolated
- All SCRAM actions are complete
- The pressure Control malfunction was corrected

WHICH ONE of the following describes the sequence of actions required before the MSIVs will re-open from their switches?

a. Perform Isolation Logic reset (Blue/Green)
THEN
Place one MSIV switch in the CLOSE position
THEN
Place it to the OPEN position

b. Place all MSIVs in the CLOSE position
THEN
Perform Isolation Logic reset (Blue/Green)

c. Perform Isolation Logic reset (Blue/Green)
THEN
Place all MSIV switches in the CLOSE position
THEN
Raise Main Steam Line pressure above 756 psig

d. Place all MSIV switches in CLOSE
THEN
Raise Main Steam Line pressure above 756 psig

28) PV:1.0

Unit 1 plant conditions are as follows:

- OPCON 3
- RPV pressure is 30 psig
- "1B" loop of Shutdown Cooling is in service

RPV pressure transmitter output PT42-1N078C (NSSSS Group IIA, RHR Cut-In Permissive) fails downscale.

WHICH ONE of the following actions is required?

a. Place "C" channel isolation logic in the tripped condition within twelve (12) hours

b. Restore "C" channel isolation logic to operable with six (6) hours

c. Close HV51-1F015B, RHR Shutdown Cooling Return Outboard within one (1) hour

d. Verify an alternate method of decay heat removal is available within one (1) hour

29) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor startup is in progress
- Reactor power 12%
- RPV level +35"

Control rod withdraw is in progress

WHICH ONE of the following conditions will result in a rod withdraw block?

a. RBM downscale

b. RPIS "DATA FAULT" alarm

c. RMCS "ACTIVITIES CONTROL DISAGREE" alarm

d. Control rod inserted past its insert limit

30) *PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- Turbine Enclosure HVAC is lost
- A GP-4 shutdown was performed
- "2B" CRD pump is in service

Both Reactor Recirc Pumps are removed from service

WHICH ONE of the following describes how RPV Bottom Head Drain temperature changes over the next two (2) hours and the reason why? (Assume no operator action)

a. Rises due to decreasing flow through the RWCU recirc. pump suction line

b. Drops due to decreasing flow through the RWCU recirc. pump suction line

c. Drops due to decreasing flow through the RWCU bottom head drain line

d. Rises due to decreasing flow through the RWCU bottom head drain line

31) PV:1.0

Unit 1 plant conditions are as follows:

- OPCON 5*
- A fuel bundle is being transferred from the SFP to the Core

WHICH ONE of the following conditions will cause the Refueling Platform to automatically stop before moving over the Core?

a. An SRM fails upscale

b. A Refuel Floor area rad monitor alarm

c. The Reactor Mode switch placed in SHUTDOWN

d. A control rod is selected at the Rod Select Matrix

32) PV:1.0

Plant conditions are as follows:

- 100% power
- 30 scfm Offgas effluent flow
- Offgas dewpoint monitor is reading 40°F

Charcoal Vault refrigeration compressors trip and cannot be restarted.

WHICH ONE of the following describes expected change in the activity of the Offgas effluent and the monitoring location?

	Change in Activity	Monitoring Location
a.	Increase	North Stack
b.	Increase	South Stack
c.	Decrease	North Stack
d.	Decrease	South Stack

33) *PV:1.0

Plant conditions are as follows:

- Unit 1 & Unit 2 REHVAC systems are in operation
- Unit 1 RF HVAC is in operation
- SGD-206-3 (Refuel Floor) is open
- SGD-506-2 (Unit 2 RE) is closed
- SGD-206-1 (Unit 1 RE) is open
- Zone 1 and 3 HVAC Interlocks are cross-tied

WHICH ONE of the following describes the status of RE and Refuel HVAC systems if power is lost to all Unit 1 RE HVAC Exhaust rad monitors?

	Unit 1 RE	Unit 2 RE	Refuel Floor
a.	Isolates	Remains running	Isolates
b.	Isolates	Isolates	Remains running
c.	Remains running	Remains running	Isolates
d.	Remains running	Isolates	Remains running

34) *PV:1.0

Unit 1 plant conditions are as follows:

- 20% power
- 240 MWe

WHICH ONE of the following conditions will generate a Main Turbine trip signal?

a. Main Turbine Lube Oil Bearing header pressure drops to 15 psig

b. Thrust Bearing Wear Detector senses displacement of 45 mils

c. Main Condenser vacuum drops to 23" Hg vac

d. Main Turbine Control Valve fails closed

35) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 5
- Spent Fuel Pool to Reactor Well gates are installed
- All Fuel Pool Cooling and Cleanup pumps are in service
- "2A" RHR pump is in Shutdown Cooling

Refuel Bridge LSRO reports Unit 2 Reactor Well level is dropping at one (1) inch per minute.

WHICH ONE of the following describes a makeup method per S53.0.A, RESPONSE TO LOW LEVEL IN FUEL STORAGE POOL OR REACTOR WELL, and the given conditions?

a. Condensate Transfer using hoses from "Refuel Flr Serv Conn" to the SFP

b. Condensate Transfer by opening HV-51-2F017A, "2A" RHR LPCI Inj PCIV (OUTBOARD)

c. Demineralized water makeup to the Skimmer Surge Tanks

d. CST water from the Control Rod Drive Hydraulic system

36) *PV:1.0

Unit 1 plant conditions are as follows:

- Traversing In-Core Probe runs are in progress for OD-1
- "1C" Drive Control Unit is in AUTO mode
- "CORE TOP" white light lit

AC power to NSSSS Group VIII B, TIPS, isolation logic is lost.

WHICH ONE of the following describes "1C" TIP Drive response?

a. Detector remains at present location, ball valve closes

b. Detector remains at present position, shear valve actuates

c. Detector withdraws to Shield, ball valve closes

d. Detector withdraws to Indexer, shear valve actuates

37) PV:1.0

Unit 1 conditions are as follows:

- 100% power
- Ten (10) days ago, a sample of both Control Room Emergency Fresh Air Supply (CREFAS) charcoal adsorbers carbon was removed and sent for laboratory analysis

The results of the analysis indicates Methyl Iodide penetration is 1.23% in both charcoal adsorbers

WHICH ONE of the following actions is required?

a. Initiate and maintain operation of one CREFAS subsystem in the Radiation Mode of operation

b. Replace the charcoal within 7 days
OR be in Hot Shutdown within the next 12 hours
AND Cold Shutdown within the following 24 hours

c. Within one (1) hour, initiate a shutdown and be in STARTUP within 6 hours, HOT SHUTDOWN within the following 6 hours
AND COLD SHUTDOWN within the subsequent 24 hours

d. Re-perform the sample within 24 hours
OR be in STARTUP within 6 hours, HOT SHUTDOWN within the following 6 hours
AND COLD SHUTDOWN within the subsequent 24 hours

38) PV:1.0

*** REFER TO ATTACHMENT #1 TO ANSWER THE FOLLOWING QUESTION ***

Unit 2 plant conditions are as follows:

- OPCON 1
- "2A" Core Spray Loop was declared inoperable 5 days ago
- All other ECCS are operable

WHICH ONE of the following describes the minimum guideline for scheduling the online repair work to restore "2A" Core Spray Loop to operable status?

a. 8 hours per day until complete

b. 16 hours per day until complete

c. 24 hours per day until complete

d. Complete within the next scheduled Work Week

39) *PV:1.0

A General Emergency is declared as the initial classification following a plant transient

WHICH ONE of the following describes an ERP-200, EMERGENCY DIRECTOR RESPONSE, 15 minute notification requirement?

a. Notify the NRC Resident

b. Notify the Plant Manager

c. Notify the State and Counties

d. Notify the Emergency Response Manager

40) PV:1.0

Activities performed during the past 12 hours include:

- "A" Recirc pump speed was raised from 80% to 85%
- Instrument Air was aligned to feed Instrument Gas headers
- Drywell cooling was maximized

Given the following:

- Drywell pressure is 0.80 psig and rising slowly
- Containment Leak Detector is unchanged

WHICH ONE of the following actions will stop the Drywell pressure rise?

a. Isolate RWCU

b. Secure and isolate "A" Recirc pump

c. Start an additional Drywell Cooler fan

d. Isolate Instrument Air to Instrument Gas headers

41) *PV:1.0

Unit 2 conditions are as follows:

- 90% power
- Both recirc pumps are at 80% speed
- "2B" M-G fluid drive scoop tube lock is ON

"2B" Condensate pump breaker trips

Five (5) minutes later, the "HIGH LIMIT" reset pushbuttons for both Recirc pumps are depressed

(No additional operator actions are performed)

WHICH ONE of the following describes the change(s) in Recirc pumps speed due to the events above?

	"2A" Recirc Pump Speed	"2B" Recirc Pump Speed
a.	increase	increase
b.	no change	no change
c.	increase	no change
d.	no change	increase

42) *PV:1.0

Unit 2 plant conditions are as follows:

- 24% power
- RPV pressure is 990 psig

An EHC Pressure Regulator Gain Unit output failure results in the following:

- Main Turbine Control valves closing slowly
- REACTOR HI PRESSURE alarm

WHICH ONE of the following describes an action to control RPV pressure per OT-102, REACTOR HIGH PRESSURE?

a. Raise EHC Pressure Setpoint

b. Open Bypass valve(s) using the Jack

c. Lower EHC Load Limit Potentiometer output

d. Place the Backup EHC Pressure Regulator Unit in service

43) *PV:1.0

Given the following:

Instrument	Maximum Run Temperature (MRT)	Minimum Indicated Level (MIL)
Fuel Zone, LI42-1R610	127°F	-303"

WHICH ONE of the following sets of conditions will make LI42-1R610 indication NOT usable?

	Instrument Area Temperature	Indicated Level
a.	112°F	-320"
b.	130°F	-310"
c.	112°F	-290"
d.	130°F	-300"

44) *PV:1.0

WHICH ONE of the following describes conditions in which adequate Core cooling is NOT ensured?

a. RPV level -180" and steady, "A" loop Core Spray injecting

b. RPV level -238", ATWS in progress, 5 SRVs open, RPV pressure is 325 psig

c. RPV level -200" and steady, RPV pressure is 200 psig and steady, no injection

d. RPV level unknown, 5 ADS valves open, RPV pressure is 60 psig, Suppression Pool pressure is 23 psig

45) PV:1.0

Unit 1 conditions are as follows:

- 100% power
- Reactor level drops to -15" before being restored to +17"
- 19 Control Rods fully insert
- All other rods are at varying positions
- All blue "SCRAM" lights are lit on the Full Core display

WHICH ONE of the following procedures must be performed to insert the control rods?

a. T-215, De-energization of scram solenoids

b. T-216, Manual isolation and vent of scram air header

c. T-213, Individual control rod scram/solenoid de-energization

d. T-217, RPS/ARI reset and backup method of draining scram discharge volume

46) *PV:1.0

The following events have occurred:

- GP-4, Rapid Plant Shutdown, was performed
- RPV level increased to +62" and was restored to +35"
- RPV pressure is 960 psig

A small break LOCA occurs causing Drywell pressure to rise to 2.3 psig and RPV level to slowly drop to 0.0".

WHICH ONE of the following actions will initiate HPCI injection to the RPV with the conditions stated above?

a. Depress "OPEN" pushbutton on HPCI flow controller

b. Arm and depress the "HPCI INITIATION" pushbutton

c. Depress the "RX LEVEL HIGH RESET" pushbutton

d. Depress the "SEAL-IN RESET" pushbutton

47) PV:1.0

Unit 1 plant conditions are as follows:

- Drywell pressure is 25 psig
- Drywell temperature is 250°F
- RPV level dropped to -79" and has been recovered to +17"
- RPV pressure is 600 psig and steady
- "1B" Loop of RHR is in Suppression Pool spray

"1A" loop of RHR is placed in Drywell Spray

WHICH ONE of the following identifies the status of the "1A" RHR Loop LOCA signal and the HV51-1F017A, "1A" RHR LPCI Inj PCIV (OUTBOARD), valve "Override" light?

	"1A" RHR Loop LOCA Signal	HV51-1F017A "Override" light
a.	present	energized
b.	not present	de-energized
c.	present	de-energized
d.	not present	energized

48) *PV:1.0

Unit 1 Plant Conditions are as follows:

- A fire in the Cable Spreading Room has caused MCR evacuation
- All immediate operator actions are complete
- All Remote Shutdown Transfer switches are in "EMERGENCY"

WHICH ONE of the following interlocks are still enabled?

a. RCIC High Level Trip

b. D11, D12, D13 DG Breaker auto close

c. ESW Return to Spray Pond on "A" ESW Pump start

d. HV-51-1F016A "A" Containment Spray Outboard Isolation Valve" open permissive interlock

49) PV:1.0

*** REFER TO ATTACHMENT #2 TO ANSWER THE FOLLOWING QUESTION ***

Plant conditions are as follows:

- Drywell pressure is 54 psig
- Suppression Pool pressure is 68 psig
- Drywell temperature is 360°F

WHICH ONE of the following describes the ability to spray the Drywell?

a. Is not permitted

b. Is permitted using RHR only

c. Is permitted using RHRSW or Fire Water only

d. Is permitted using RHR, RHRSW, or Fire Water

50) PV:1.0

Unit 1 plant conditions are as follows:

- Entered OPCON 3, twelve (12) minutes ago, due to Drywell pressure increase to 2.5 psig.
- Main Steam Line rad monitors are trending upward.

WHICH ONE of the following identifies the discharge location and the HVAC filter(s) which are limiting Offsite release rate from Unit 1 HPCI vacuum pump?

	Discharge location	HVAC Filter(s)
a.	South Stack	RERS only
b.	South Stack	REECE only
c.	North Stack	REECE and SBGT
d.	North Stack	RERS and SBGT

51) *PV:1.0

*** REFER TO ATTACHMENT #3 TO ANSWER THE FOLLOWING ***

Unit 2 conditions are as follows:

- A plant shutdown is in progress due to high coolant activity
- North Stack Rad Monitor indicates 10 times the Hi-Hi alarm setpoint value for 75 minutes
- Calculated Offsite dose rates are 0.4 mRem/hr TPARD based on a 60 minute average

WHICH ONE of the following identifies the minimum ERP Classification and the requirement to enter T-104?

	ERP Classification	T-104 entry required
a.	Unusual Event	Yes
b.	Unusual Event	No
c.	Alert	Yes
d.	Alert	No

Enclosure: Initial Examination Report No. 05000352/2000-301 and 05000353/2000-301 w/Attachments 1 and 2

cc w/encl; w/Attachment 1-2:
J. Klenk, Manager-Training

cc w/encl; w/o Attachment 1-2:
J. J. Hagan, Senior Vice President, Nuclear Operations Station Support
G. Edwards, Chairman, Nuclear Review Board
J. A. Hutton, Director - Licensing, PECO Nuclear
J. D. von Suskil, Vice President - Limerick Generating Station
M. P. Gallagher, Plant Manager, Limerick Generating Station
K. P. Bersticker, Manager, Experience Assessment Manager
Secretary, Nuclear Committee of the Board
Commonwealth of Pennsylvania

Distribution w/encl; w/Attachment 1-2:
DRS Master Exam File
PUBLIC
Nuclear Safety Information Center (NSIC)

Distribution w/encl; w/o Attachment 1-2: **(VIA ADAMS)**
Region I Docket Room (with concurrences)
NRC Resident Inspector
H. Miller, RA/J. Wiggins, DRA
C. Cowgill, DRP
D. Florek, DRP
D. Cullison, DRP
W. Lanning, DRS
B. Holian, DRS
R. Conte, DRS
P. Bissett, Chief Examiner, DRS
V. Curley, DRS (OL Facility File)
DRS File
J. Shea, OEDO
E. Adensam, NRR
J. Clifford, NRR
B. Buckley, NRR
W. Scott, NRR
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OFFICE	RI/DRS	RI/DRP	RI/DRS		
NAME	PBissett	CCowgill	RConte		
DATE	04/24/00	04/ /00	04/ /00	04/ /00	04/ /00

5/3/2000 OFFICIAL RECORD COPY

EXECUTIVE SUMMARY
Limerick Generating Station, Units 1 and 2
NRC Inspection Report 05000352/2000-301, 05000353/2000-301

Findings were assessed according to potential risk significance and, if applicable, were assigned colors of *green, white, yellow, or red.* The inspection had no findings. *Green* findings, while not necessarily desirable, would have represented very low risk to safety. *White* findings would have indicated issues with low to moderate risk to safety and which may have required additional NRC inspections. *Yellow* findings would have indicated more serious issues with substantial risk to safety and would have required the NRC to take additional actions. *Red* findings would have represented an unacceptable loss of margin to safety and would have resulted in the NRC taking significant actions that could have included ordering the plant to shut down. The findings, considered in total with other inspection findings and performance indicators, will be used to determine overall plant performance.

- There were no significant inspection findings.

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.	05000352, 05000353
License Nos.	NPF-39, NPF-85
Report Nos.	05000352/2000-301, 05000353/2000-301
Licensee:	PECO Nuclear Correspondence Control Desk P.O. Box 195 Wayne, PA 19087-0195
Facilities:	Limerick Generating Station, Units 1 and 2
Location:	Limerick, PA 19468
Dates:	April 3 - 7, 2000 (Operating Test Administration) April 10 - 14, 2000 (Grading)
Examiners:	P. H. Bissett, Senior Operations Engineer C. E. Sisco, Operations Engineer J. G. Caruso, Operations Engineer
Approved by:	Richard J. Conte, Chief Operational Safety Branch Division of Reactor Safety

Report Details

4. OTHER ACTIVITIES (OA)

4OA4 Cross Cutting Issues

.1 Reactor Operator and Senior Reactor Operator Initial License Examinations

a. Scope

The NRC reviewed the written and operating initial examinations submitted by the Limerick staff to ensure that they were prepared and developed in accordance with the guidelines of Revision 8 of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors". The review was conducted both in the Region I office and at the Limerick facility. Final resolution of comments and incorporation of test revisions was conducted during and following the onsite preparation week. Eleven applicants took the examination, with one of the SRO applicants taking only the written examination, as part of a retake examination. The NRC examiners administered the operating portion of the examination to 10 applicants from April 3 through 7, 2000. The written examinations were administered to 11 applicants by Limerick's training organization on March 31, 2000.

The examiners verified that the initially submitted written and operating examination met the overall quality goals (range of acceptability) of NUREG-1021, Revision 8 (interim guidance is contained in Report of Interaction 99-18, dated November 24, 1999, and posted on the NRC's internet home page). Some questions were replaced and most changes reflected editorial/enhancement changes and/or additions to the proposed exam.

Exam scenarios were validated on the Limerick simulator. Some changes were made in an effort to ensure that operator actions or decision making involved some safety significance to which a licensing decision could be made. The administrative questions and/or job performance measures (JPMs) were validated either on the simulator or in the plant, and were verified to be acceptable.

After the examination, the chief examiner verified that there were no simulation facility problems and that the facility licensee completed a test item analysis for feedback to the systems approach to training programs.

b. Observations and Findings

Grading and Results

Ten of eleven applicants passed all portions of the initial licensing examination.

Nine of the ten applicants who passed all portions of the examination were issued licenses on April 20, 2000. The license for one applicant, whose final written score was 80%, was not issued pending the results of a possible appeal from the one applicant who failed the written examination.

Examination Preparation and Quality

Three facility operating procedure problems, identified by the NRC during the exam validation prep week, were captured by the licensee under their corrective action program as PEP issue I0010999.

Examination Administration and Performance

No inspection findings were identified.

4OA6 Exit Meeting Summary

On April 7, 2000, the NRC discussed preliminary overall observations during the examination with Limerick Training personnel. On April 20, 2000, the NRC provided final conclusions and examination results to Mr. M. Gallagher, and other staff members, at an exit meeting conducted at the Limerick training center. License numbers for 9 of the 11 applicants were also provided during this exit meeting.

The NRC also expressed appreciation for the cooperation and assistance that was provided during the preparation and actual conduct of the exam by the licensee's training staff and examination team.

Attachments:
1. SRO Written Exam w/Answer Key
2. RO Written Exam w/Answer Key

PARTIAL LIST OF PERSONS CONTACTED

Limerick

C. Fritz	Exam Team Member
M. Gallagher	Plant Manager
C. Goff	Exam Team Member
R. Harding	Licensing
J. Klenk	Operations Training Manager
D. Malinowski	Exam Team Lead
J. Tucker	Operations Manager
T. Wasong	Training Director

NRC

P. Bissett	Senior Operations Engineer/Examiner
C. Sisco	Operations Engineer/Examiner
J. Caruso	Operations Engineer/Examiner

Attachment 1

SRO WRITTEN EXAM W/ANSWER KEY

LIMERICK GENERATING STATION

2000 NRC LICENSE EXAM

SENIOR REACTOR OPERATOR

WRITTEN

1) PV:1.0

Unit 1 plant conditions are as follows:

- Reactor power is 100%
- RPV level is +35"
- Drywell pressure is 0.3 psig

A blown fuse has caused an inadvertent DWCW Inboard valve isolation.

WHICH ONE of the following identifies the "1A" Recirc pump component that has lost cooling water supply?

a. motor oil cooler

b. seal oil cooler

c. motor air cooler

d. seal air cooler

2) *PV:1.0

Unit 1 conditions are as follows:

- 100% power
- Plant Air systems are in a normal full power line-up
- Both "1A" and "1B" Instrument Air Receiver pressures are 89 psig
- Unit 1 Service Air Receiver pressure is 94 psig
- No Operator action is taken

Later, "1A" and "1B" Insrument Air Receiver pressures indicate 94 psig and 98 psig respectively with both slowly rising

WHICH ONE of the following describes the status of the Plant Air System?

a. Both Instrument Air compressors are running fully loaded

b. Service Air has automatically aligned to supply the "1A" Instrument Air header

c. The Backup Service Air compressor has automatically aligned to supply the "1B" Instrument Air header

d. The "1A" Instrument Air compressor is running fully loaded and the "1B" Instrument Air compressor is running unloaded

3) *PV:1.0

Plant conditions are as follows:

- A Loss of Offsite Power has occurred
- All 4KV Safeguard Buses are energized

WHICH ONE of the following identifies a system capable of supplying water flow directly to the Containment Unit Coolers?

a. Service Water

b. Drywell Chilled Water

c. Emergency Service Water

d. Reactor Enclosure Cooling Water

4) PV:1.0

WHICH ONE of the following systems would automatically initiate and extinguish a Class "A" fire in the Unit 2 Cable Spread Room?

a. Halon

b. Cardox

c. Protein foam

d. Wet-pipe sprinkler

5) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor power is 100%
- RCIC is aligned for auto injection

An electrical fault results in the complete loss of DIVISION 3, 125 VDC.

WHICH ONE of the following describes the effect on RCIC operation, if RPV level drops to -45"?

a. Exhaust Line Vacuum Breaker Inboard isolation valve (HV49-1F084) automatic isolation is disabled

b. High RPV water level automatic system shutdown is disabled

c. Low RPV water level automatic system start is disabled

d. MCR manual isolation pushbutton is disabled

6) *PV:1.0

Unit 2 conditions are as follows:

- GP-3, Reactor Shutdown is in progress
- Reactor Mode switch is in "RUN"
- The Main Turbine is tripped
- APRM indications are as follows:

Channel	Reading
2A	12%
2B	11%
2C	16%
2D	13%
2E	12%
2F	14%

The Reactor Mode Switch is moved to the "Startup" position.

WHICH ONE of the following describes the APRM Withdraw Block status and RPS Scram signal response?

	Withdraw Block	RPS scram signal
a.	Yes	Full
b.	Yes	Half
c.	No	Full
d.	No	Half

7) PV:1.0

Unit 2 plant conditions are as follows:

- RPV level is -140"
- RPV pressure is 600 psig
- D22 Safeguard 4KV bus is de-energized due to a bus lockout
- No operator actions have been taken

RPV pressure drops to 200 psig

WHICH ONE of the following describes the status of the "2B", "2D" Core Spray pumps, and "2B" Loop CS Inboard Injection valve (HV52-2F037)?

	"2B" CS Pump	"2D" CS Pump	HV52-2F037
a.	On	Off	Closed
b.	On	Off	Open
c.	Off	On	Closed
d.	Off	On	Open

8) *PV:1.0

Unit 1 is in OPCON 5

"1A" RPS Electric Power Monitoring Channel Calibration results are as follows:

Overvoltage relay trip setpoint	129 VAC
Underfrequency relay trip setpoint	56 Hz
Undervoltage relay trip setpoint	107 VAC

WHICH ONE of the following describes required actions?

a. Immediately bypass and remove the "1A" RPS/UPS static inverter from service

b. Immediately transfer the "1A" RPS/UPS inverter static switch to its alternate supply

c. Restore "1A" RPS/UPS Power Monitor to operable within 72 hours or remove "1A" RPS/UPS static inverter from service

d. Restore "1A" RPS/UPS Power Monitor to operable within 7 days or remove "1A" RPS/UPS static inverter from service

9) *PV:1.0

Unit 2 conditions are as follows:

- The MSIVs are closed
- Reactor pressure is 880 psig
- Both Primary Containment Instrument Gas Receivers are depressurized
- No Alternate pneumatic supplies are available

WHICH ONE of the following identifies an SRV available for RPV cooldown and where it can be operated from?

a. "2A" from the MCR

b. "2J" from the MCR

c. "2K" from the Remote Shutdown Panel

d. "2S" from the Remote Shutdown Panel

10) PV:1.0

Unit 1 Plant conditions are as follows:

- Feedwater System flushing is in progress
- Reactor Feed Pump Turbine Windmilling protection is active for all RFPTs (Keylock switches in "BYPASS")

"1A" RFPT speed rises to 700 rpm

WHICH ONE of the following describes the response of the Reactor Feedwater System?

a. Only "1A" RFP Suction valve closes

b. Only "1A" RFP Discharge valve closes

c. All RFP Suction valves close

d. All RFP Discharge valves close

11) *PV:1.0

ESW is in a normal valve alignment with:

- SPRAY/BYPASS SELECT switches, HSS-12-16A-1(C-1,B,D), in "SPRAY"
- POND/TWR 1(2) SELECT switches, HSS-12-15A-1(C-1,B,D), are normal after "SPRAY POND"
- AUTO VLV LINEUP BYPASS switches, HSS-12-19A(B,C,D), are in "NORM"

D12 Diesel automatically starts

Thirty (30) minutes later, the "B" SPRAY/BYPASS SELECT switch, HSS-12-016B, is placed in "BYPASS"

WHICH ONE of the following describes the status of "A" and "B" Loop ESW return flows to the Spray Pond?

	"A" Loop return to Spray Pond	"B" Loop return to Spray Pond
a.	isolated	thru Bypass only
b.	thru Bypass only	isolated
c.	thru Bypass only	thru Bypass only
d.	isolated	isolated

12) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor power is 80%
- Reactor pressure is 960 psig
- "1A" CRD pump is in service
- All Scram Accumulator Trouble lights are out

Control rod 30-31 Scram Inlet (XV-47-1-26) valve fails open

WHICH ONE of the following states the initial sources of differential pressure across rod 30-31 and its response?

	High pressure Supply	Low pressure Exhaust	Response
a.	RPV pressure	Scram Discharge Volume	drift in
b.	Accum. N2 gas	RPV pressure	no movement
c.	RPV pressure	Scram Discharge Volume	no movement
d.	Accum. N2 gas	RPV pressure	drift in

13) *PV:1.0

Unit 2 conditions are as follows:

- Reactor power is 100%
- A high radiation condition occurs at the outside air intake to the Control Room Ventillation System

Control Room Ventillation Rad Monitor Channel "A" fails to detect the high rad condition.

WHICH ONE of the following describes "A" CREFAS (Control Room Emergency Fresh Air Supply) Fan response and MCR ventillation?

a. WILL automatically start, MCR supplied with some outside air

b. WILL automatically start, MCR supplied with recirculated air

c. WILL NOT automatically start, MCR supplied with recirculated air

d. WILL NOT automatically start, MCR supplied with some outside air

14) *PV:1.0

WHICH ONE of the following identifies the Unit 1 and Unit 2 RHR loops which return directly to the Fuel Pool in Fuel Pool Cooling and Cleanup Assist Mode?

	Unit 1	Unit 2
a.	A	A
b.	A	B
c.	B	A
d.	B	B

15) PV:1.0

Unit 1 Containment purge is in progress per T-228, Inerting/Purging Primary Containment.

WHICH ONE of the following methods must be manually isolated if the SOUTH STACK HI-HI RADIATION annunciator alarms?

a. Drywell Purge with Air

b. Suppression Pool Purge with Air

c. Drywell Inerting with Nitrogen (Hi Flow Mode)

d. Suppression Pool Inerting with Nitrogen (Low Flow Mode)

16) *PV:1.0

Unit 1 plant conditions are as follows:

- OPCON 1
- 18% power
- Power assension is in progress
- Main Condenser vacuum is 28.5" Hg Vac

Main Condenser vacuum drops then stablizes at 10.5" Hg Vac.

RPV water level is maintained at 35"

WHICH ONE of the following lists automatic plant response?

a. Main Turbine trip, Reactor scram

b. Main Turbine trip, RFPTs trip

c. MSIV isolation, Reactor scram

d. RFPTs trip, MSIV isolation

17) *PV:1.0

The following events have occurred:

- The Main Turbine is tripped
- Reactor power is 60%

WHICH ONE of the following states a required pressure control strategy per T-101, RPV CONTROL, and the reason for it?

a. Stablize RPV pressure with HPCI to minimize heat input into the Suppression Pool

b. Reduce RPV pressure with HPCI to minimize operation of Safety Relief Valves

c. Reduce RPV pressure with Turbine Bypass Valves to minimize heat input into the Suppression Pool

d. Stablize RPV pressure with Safety Relief Valves to minimize power fluctuations

18) *PV:1.0

The following events have occured:

- A Feedwater level control failure has occured
- RPV level is +125"
- RPV pressure is 675 psig and rising
- MSIVs are closed

OT-110, REACTOR HIGH LEVEL, directs RPV pressure be maintained below 700 psig.

WHICH ONE of the following identifies the SRV to manually open and the reason why?

a. "K", minimize potential for tailpipe break

b. "B", minimize potential for tailpipe break

c. "K", prevent uneven heat distribution in the Suppression Pool

d. "B", prevent uneven heat distribution in the Suppression Pool

19) *PV:1.0

Plant conditions are as follows:

- 92% power
- RPV level is +35"
- "A" Narrow Range level is selected
- Feedwater level control is 3-element
- Master level controller is in AUTO

"D" Steam Flow transmitter equalizing valve is opened

WHICH ONE of the following describes the effects on RPV water level and plant response?

	RPV level	Plant response
a.	Increases	Main Turbine trips
b.	Decreases	Reactor scrams
c.	Increases	Main Turbine remains on line
d.	Decreases	Reactor remains at power

20) *PV:1.0

Unit 1 plant conditions are as follows:

- 50% power
- Reactor pressure is 1038 psig
- Reactor level is +35"

"1C" Inboard MSIV (HV41-1F022C) slowly drifts fully closed

WHICH ONE of the following describes the maximum allowed power and the bases for that power level?

	Power Level	Bases
a.	75%	Prevents exceeding MCPR thermal limit
b.	75%	Ensures steam flow in remaining steam lines does not exceed 100%
c.	90%	Prevents exceeding MCPR thermal limit
d.	90%	Ensures steam flow in remaining steam lines does not exceed 100%

52) *PV:1.0

Unit 1 plant conditions are as follows:

- OPCON 4
- RPV level is +85" on Upset Range
- "1B" Loop of Shutdown Cooling (SDC) is in service

RPV level drops to +55"

WHICH ONE of the following describes the impact on plant operation?

a. Insufficient NPSH for RHR pump operation

b. Inadequate margin to SDC isolation setpoint

c. Valid RPV Coolant Temperature is lost

d. Natural Circulation is lost on a loss of SDC

53) *PV:1.0

Unit 2 plant conditions are as follows:

- DIV 3 Safeguard DC power is lost

WHICH ONE of the following describes the response of DIV 3, 4KV and 480V Safeguard breakers if a protective relay signal is received?

a. Only 4KV breakers will trip

b. Only 480V breakers will trip

c. Both 4KV and 480V breakers will trip

d. Neither 4KV nor 480V breakers will trip

54) *PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- "A" loop of Drywell Chilled Water is in service

D21 4KV bus lockout occurs and Drywell temperature begins rising

WHICH ONE of the following describes the required action to mitigate the conditions above?

a. Start "2B" Drywell Chiller

b. Increase Load setting on "2A" Drywell Chiller

c. Align ESW to "2B" Drywell Chiller

d. Increase Service Water flow to "2A" Drywell Chiller

55) *PV:1.0

Plant conditions are as follows:

- All APRM downscale alarms are clear
- RPV pressure is 850 psig
- Both CRD pumps are tripped
- Three (3) withdrawn control rods have local accumulator pressure at 940 psig

WHICH ONE of the following describes required action?

a. Restart one CRD pump within 20 minutes

b. Be in at least HOT SHUTDOWN within twelve (12) hours

c. Place the Reactor Mode Switch in the SHUTDOWN position

d. Insert the inoperable control rods and disarm the associated control valves

56) PV:1.0

Unit 1 conditions are as follows:

- A plant cooldown is in progress
- Reactor Coolant Temperature is 240°F
- "1B" Reactor Recirc Pump is running
- The "1A" RHR Pump is operating in the Shutdown Cooling Mode

At 1300, "1A" RHR pump trips

WHICH ONE of the following describes the required action?

a. No action is required until 1500 provided "1B" Loop of Shutdown Cooling remains operable

b. Verify the availability of an alternate method of decay heat removal by 1400 today

c. Immediately place the demonstrated alternate method of decay heat removal in service

d. No action is required until 2100 provided "1B" Loop of Shutdown Cooling remains operable

57) PV:1.0

Unit 2 plant conditions are as follows:

- Reactor scrammed due to Drywell pressure
- RCIC is being operated for level control
- RPV pressure is 450 psig and steady

Condensate injection raises RPV level to 95"

WHICH ONE of the following describes the response of the RCIC System?

a. HV-49-112, Trip Throttle valve closes

b. HV-49-1F045, Steam Supply valve closes

c. HV-49-1F008, Outboard Isol. valve closes

d. HV-49-1F012, Pump Discharge valve closes

58) *PV:1.0

Plant conditions are as follows:

- SGD-206-1 (Unit 1 RE) is open
- SGD-506-2 (Unit 2 RE) is open
- SGD-206-3 (Refuel Floor) is open
- Unit 2 RF Ventilation is in service
- Zones 1 and 3 HVAC Isolation Interlocks are cross-tied

WHICH ONE of the following conditions will cause an isolation of Unit 1 RE HVAC and Unit 1 RF HVAC?

a. Unit 2 Refuel Floor Vent Exh Rad level at 2.2 mr/hr

b. Unit 1 Refuel Floor Vent Exh Rad level at 1.8 mr/hr

c. Unit 1 Reactor Enclosure Vent Exh Rad level at 1.2 mr/hr

d. Unit 2 Reactor Enclosure Vent Exh Rad level at 2.4 mr/hr

59) PV:1.0

Unit 1 is at 100% power

The following events have occurred:

- DIV 3 STEAM LEAK DET SYS HI TEMP/TROUBLE annunciator alarmed
- DIV 3 Turbine Enclosure - Main Steam Line temperature element, TE25-115C is above trip setpoint reading 175°F and rising

DIVISION 4 Turbine Enclosure - Main Steam Line temperature element, TE25-115D, rises to 190°F?

WHICH ONE of the following identifies MSIV response?

	Inboard MSIVs	Outboard MSIVs
a.	remain open	remain open
b.	close	remain open
c.	remain open	close
d.	close	close

60) *PV:1.0

Unit 1 conditions are as follows:

- 100% power
- RE HVAC Differential Pressure is 0.18" H_2O vacuum
- Wind speed is 2 mph from the NW

The following events occur:

- "A" Standby Gas Treatment (SBGT) Fan AND Filter are placed in service
- RE dp stablizes at 0.19" H_2O vacuum
- "B" SBGT Fan AND Filter are started AND the "A" SBGT Fan AND Filter are secured
- RE dp stablizes at 0.25" H_2O vacuum
- SBGT flow is 9200 scfm

WHICH ONE of the following actions is required?

a. Be in at least STARTUP within the next 6 hours

b. Be in at least HOT SHUTDOWN within the next 12 hours

c. Restore "A" SBGT to operable status within the next 12 hours

d. Restore RE Secondary Containinment Integrity within 4 hours or be in HOT SHUTDOWN within the next 12 hours

61) *PV:1.0

Unit 2 plant conditions are as follows:

- 75% power
- "2A" Reactor Recirc Pump (RRP) was manually tripped and its discharge valve was closed
- Indicated Total Core Flow is 48 Mlb/hr

After five (5) minutes, the "2A" RRP discharge valve is re-opened

WHICH ONE of the following identifies the change in "2B" Recirc Loop Flow when "2A" RRP tripped and Indicated Total Core Flow when the "2A" RRP discharge valve opens?

	"2B" Recirc Loop Flow (due to "2A" RRP trip)	Indicated Total Core Flow (due to "2A" RRP discharge valve open)
a.	Increase	Increase
b.	Decrease	Increase
c.	Increase	Decrease
d.	Decrease	Decrease

62) PV:1.0

Unit 1 plant conditions are as follows:

- A LOCA has occurred
- Automatic ADS blowdown is in progress
- All ECCS pumps auto started
- Reactor pressure is 200 psig and dropping
- Reactor level was recovered to -100"

All RHR pumps are secured

WHICH ONE of the following will stop the ADS blowdown?

a. Stop "1A" and "1C" Core Spray pumps

b. Stop "1C" and "1D" Core Spray pumps

c. Place both AUTO ADS switches in INHIBIT

d. Depress both High Drywell Pressure RESET pushbuttons

63) *PV:1.0

Unit 1 plant conditions are as follows:

- 100% power
- RPS Scram Funtional testing is in progress
- An "A" side RPS Scram signal is manually inserted

The Group "B2" RPS solenoid power fuse blows and Group "B2" indicating light on 10C603 panel deenergizes.

WHICH ONE of the following identifies the status of Control Rods and Scram Discharge Volume (SDV) vent and drain valves ten (10) seconds after the fuse blows, if no operator actions are taken?

	Control Rods	SDV vents and drains
a.	47 rods scram	open
b.	All rods scram	open
c.	47 rods scram	closed
d.	All rods scram	closed

64) *PV:1.0

Unit 1 conditions are as follows:

- A 50% Power ATWS is in progress
- A complete rupture of "A" steam line occurs in the Drywell
- Suppression Pool Water level is 24'

WHICH ONE of the following will result from a complete loss of Drywell Spray?

a. High Suppression Pool temperature requiring an unmonitored Offsite release

b. High Suppression Pool pressure causing Drywell Floor upward differential pressure maximum to be exceeded

c. High Suppression Pool pressure requiring a monitored Offsite release

d. High Suppression Pool temperature causing Drywell Floor upward differential pressure maximum to be exceeded

65) *PV:1.0

Plant conditions are as follows:

- A Reactor Enclosure HVAC High Rad isolation occurs
- "A" Standby Gas Treatment System fan is inoperable
- "B" Standby Gas Treatment System fan starts

The "B" Standby Gas Treatment fan bypass damper is stuck shut

WHICH ONE of the following describes expected steady state Reactor Enclosure differential pressure?

a. 0.00 to +0.15 psid

b. +0.25 psid or greater (more positive)

c. 0.00 to -0.15 psid

d. -0.25 psid or greater (more negative)

66) *PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- 1160 MWe

Main Generator output current drops to 8050 Amps in 25 milliseconds.

WHICH ONE of the following describes automatic plant response to the conditions above?

a. Control valves throttle open to control RPV pressure, Reactor remains at power

b. Intercept valves throttle open to control turbine speed, Reactor remains at power

c. Main Turbine trips after 3 minute delay, Reactor scrams

d. Main Generator lockout, Reactor scrams

67) *PV:1.0

Unit 2 conditions are as follows:

- All running RWCU Pumps have tripped
- HV-44-2F001, RWCU Inboard Isolation valve is closed
- HV-44-2F004, RWCU Outboard Isolation valve is open

WHICH ONE of the following will cause the conditions above?

a. DIV II RRCS initiation

b. Loss of "2A" RPS/UPS power

c. The "2B" Standby Liquid Control pump manually started

d. Reactor Water Clean Up Filter/Demin inlet high temperature trip

68) *PV:1.0

Unit 1 is at 100% power

The following events occur:

- Excess Flow Check valve, XV-42-1F045B closes causing a Div 2 LOCA signal
- The "1B" RHR pump is manually secured

WHICH ONE of the following describes status of "1B" RHR modes?

	Pool Spray	LPCI
a.	Available	Operable
b.	Available	NOT Operable
c.	Unavailable	Operable
d.	Unavailable	NOT Operable

69) *PV:1.0

Plant conditions are as follows:

- OPCON 1
- HPCI Pump Valve and Flow Test is in progress
- Suppression Pool (SP) level is 22'3"
- Suppression Pool average temperature is 103°F
- Two Loops of Suppression Pool Cooling are in service

WHICH ONE of the following describes the Suppression Pool (SP) status and a required Tech Spec action for the conditions above?

a. Inoperable, raise SP level within limits within 1 hour

b. Inoperable, reduce SP average temperature to less than 95°F within the next 24 hours

c. Operable, verify SP temperature is less than or equal to 105°F once every 5 minutes

d. Operable, verify SP level is within limits once per 12 hours

70) *PV:1.0

Plant conditions are as follows:

- The last isotopic sample analysis from the Recombiner Aftercondenser Discharge was performed on 3/1/00 at 0800

The following are observed on 3/31/00 at the indicted time:

	0700	0800
- Main Condenser Offgas Pretreatment Rad Monitor indications	150 mCi/sec	300 mCi/sec
- Condenser In-Leakage	35 scfm	35 scfm
- Reactor Power	95%	95%

WHICH ONE of the following is the latest time the next isotopic analysis of a representative sample of gases taken at the Recombiner Aftercondenser Discharge must be performed?

a. 1200 3/31/00

b. 2000 3/31/00

c. 0800 4/1/00

d. 0200 4/9/00

71) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 1
- 5% power
- Drywell Power Entry Authorization sheet has been approved
- Drywell Entry Team is in the Drywell on 303' elevation
- "2A" and "2B" APRMS Upscale Setdown Trip setpoint is enabled

Reactor power unexpectedly increases to 12%

WHICH ONE of the following describes how the Drywell Entry Team will be protected from increased levels of radiation?

a. RPS Trip system will initiate an immediate full scram

b. The Reactor Operator shall immediately place the Reactor Mode Switch in "SHUTDOWN"

c. The Reactor Operator shall direct the Drywell Control Point to survey the work area

d. The Rod Block Monitor will initiate a control rod withdraw block

72) PV:1.0

The following sequence of events occurs on Unit 2:

- 10:00 REAC ENCL HVAC PANEL 2AC208 TROUBLE alarms
- 10:05 DIV 1 STEAM LEAK DET SYS HI TEMP/TROUBLE alarms
- 10:25 REAC ENCL ST FLOOD DAMPER PNL 10C234 TROUBLE alarms
- 10:30 MOTOR DRIVEN FIRE PUMP RUNNING alarms
- 10:40 RCIC PUMP ROOM FLOOD alarms

WHICH ONE of the following identifies when Initial and Re-Entry into T-103 is required?

	Initial Entry time	Re-entry Time
a.	10:00	10:05
b.	10:05	10:30
c.	10:00	10:25
d.	10:05	10:40

73) *PV:1.0

Given the following plant conditions:

Time	Drywell Pressure	Suppression Pool Pressure
0800	25 psig	20 psig
0815	30 psig	25 psig
0830	32 psig	29 psig
0845	35 psig	33 psig
0900	39 psig	38 psig

WHICH ONE of the following conditions will result in the above Containment pressure trend?

a. Suppression Pool water level is lowering

b. An SRV tailpipe vacuum relief has failed

c. Suppression Pool to Drywell vacuum breakers are failed closed

d. Relocation of the Drywell nitrogen to Suppression Pool airspace

74) *PV:1.0

Unit 1 conditions are as follows:

- OPCON 5*
- Core shuffle to final configuration is in progress per Core Component Transfer Authorization sheet (CCTAS)

The following SRM countrate trends are observed between CCTAS steps #265 and #266:

Time	"1A"	"1B"	"1C"	"1D"
+1 min	70	42	20	55
+2 mins	120	100	45	120
+3 mins	162	102	102	165
+4 mins	200	103	160	175

WHICH ONE of the following SRMs are indicating an inadvertent criticality?

a. "1A"

b. "1B"

c. "1C"

d. "1D"

75) *PV:1.0

Unit 1 conditions are as follows:

- 100% power

The following transient occurs:

- Four (4) SRVs open automatically on high Reactor pressure
- Five (5) control rods are stuck at position 02
- One (1) control rod is stuck at position 48
- All other control rods are full in

WHICH ONE of the following describes plant response?

	RFP Runback To Minimum	ARI Initiates	SLC Injects	RRPs Trip
a.	No	Yes	No	Yes
b.	No	No	Yes	Yes
c.	Yes	Yes	No	No
d.	Yes	Yes	Yes	Yes

76) PV:1.0

Primary Containment Control, T-102 directs the following:

- HPCI is secured if Suppression Pool level cannot be maintained above 18 feet
- RCIC is secured if Suppression Pool level cannot be maintained above 13.5 feet

WHICH ONE of the following explains why HPCI is secured at a higher level than RCIC?

a. HPCI requires a larger volume of water to condense its exhaust steam

b. HPCI exhaust sparger is located at a higher level in the Suppression Pool

c. HPCI exhaust is capable of pressurizing the Primary Containment in excess of Containment design pressure

d. The HPCI High Exhaust Pressure Turbine Trip is set lower than the RCIC High Exhaust Pressure Turbine Trip

77) *PV:1.0

Unit 1 plant conditions are as follows:

- A LOCA is in progress
- RPV level -29" and stable
- RPV pressure is 350 psig and dropping slowly
- Drywell pressure is 25 psig and rising slowly

Fifteen (15) minutes later, the following systems isolation signals are bypassed per TRIP procedures:

- Drywell Chilled Water
- H_2/O_2 Analyzers
- Primary Containment Instrument Gas

WHICH ONE of the following components are prevented from being returned to service based on the conditions given above?

a. H_2/O_2 Analyzers

b. Control Rod Drive pumps

c. Drywell Chilled Water pumps

d. Primary Containment Instrument Gas compressors

78) *PV:1.0

Unit 2 is at 100% power.

The following are observed on Unit 2:

- Sudden rise in Offgas System temperatures
- Sudden drop in Offgas System hydrogen concentration
- The in-service 1st stage Steam Jet Air Ejector (SJAE) air suction valves are closed

WHICH ONE of the following actions is required to prevent an automatic Main Turbine trip?

a. Start the Mechnical Vacuum pump

b. Open the alternate SJAE Train 1st stage air suction valves

c. Reduce power per Reactor Maneuvering Shutdown Instructions

d. Increase the in-service 2nd stage SJAE steam supply to 200 psig

79) *PV:1.0

Unit 1 conditions are as follows:

- 100% power
- An inadvertent 1.68 psig Drywell pressure isolation signal is received

The isolation signals are bypassed and flowpaths restored per GP-8.5, ISOLATION BYPASS OF CRUCIAL SYSTEMS, for:

* PCIG
* Reactor Enclosure Cooling Water
* Drywell Chilled Water
* H_2/O_2 Analyzers

WHICH ONE of the following systems will automatically re-isolate if RPV water level subsequently drops to -149"?

a. Reactor Enclosure Cooling Water

b. Drywell Chilled Water

c. H_2/O_2 Analyzers

d. PCIG to ADS valves

80) *PV:1.0

Unit 1 plant conditions are as follows:

- Offsite power is lost
- D11 Bus Lockout has occurred
- RPV level is 30" and steady
- Drywell pressure is 0.5 psig and steady

Suppression Pool level rises to 25'6"

WHICH ONE of the following T-102, Primary Containment Control, methods can can be used to lower Suppression Pool level for the given conditions?

a. "1A" RHR pump to Radwaste per S51.8.A, SUPPRESSION POOL COOLING/LEVEL CONTROL

b. Suppression Pool Cleanup pump to Radwaste per T-232, SUPP POOL CLEANUP PUMP

c. HPCI to Condensate Storage Tank per T-230, HPCI/RCIC TO CST

d. "1B" RHR pump to Radwaste per T-233, RHR TO RADWASTE

81) PV:1.0

Unit 2 conditions are as follows:

- A Group IA isolation occurred at 100% power
- HPCI is being operated for Reactor pressure control
- RCIC is being operated for Reactor level control

WHICH ONE of the following will disable HPCI pressure control mode?

a. Loss of DIV 4 DC

b. A valid DIV 2 LOCA signal

c. D22 4Kv Bus lockout

d. PCIG isolation

82) PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 2
- All APRM downscales are present
- Control Rod 34-35 is at its withdraw limit of 12

A continuous withdraw signal is applied to control rod 34-35

WHICH ONE of the following describes the Rod Worth Minimizer response?

a. Withdraw motion is prevented

b. Rod motion will stop at position 16

c. An insert block will only be applied after position 48 is reached

d. A withdraw block will only be applied after position 00 is reached

83) *PV:1.0

Unit 1 plant conditions are as follows:

- T-103 has been entered
- T-236, TRANSFERRING REACTOR ENCLOSURE FLOOR DRAIN SUMP TO SUPPRESSION POOL VIA CORE SPRAY SYSTEM, is complete
- HS-61-104, REACTOR ENCL. FLOOR DRAIN SUMP SELECTION SW is in the "HI-HI" position

WHICH ONE of the following describes the operation of the "1A" and "1B" Reactor Enclosure Floor Drain Sump Pumps given the conditions above?

a. both "1A" and "1B" pumps run continuously and will only trip on thermals

b. both "1A" and "1B" pumps run continuously and will trip on a "HI-HI" radiation signal

c. both "1A" and "1B" pumps run based on sump level and will only trip on thermals

d. both "1A" and "1B" pumps run based on sump level and will trip on a "HI-HI" radiation signal

84) *PV:1.0

Unit 1 plant conditions are as follows:

- 33 % power
- Stator Current is 11,000 Amps

Main Generator Bushing cooling flow is lost

WHICH ONE of the following describes plant response?

a. EHC Load Set runback

b. Immediate Main Turbine trip

c. Immediate "1A" Recirc pump trip

d. Sequential trip of both Recirc pumps

85) *PV:1.0

Unit 1 conditions are as follows:

- Refueling outage with Fuel Shuffle in progress

Cavity level drops to 21 feet above the vessel flange

WHICH ONE of the following describes the minimum RHR Shutdown Cooling requirements and bases?

a. Two (2) RHR Shutdown Cooling Subsystems must be operable
Ensures adequate scrubbing of Iodine activity released from fuel

b. Two (2) RHR Shutdown Cooling Subsystems must be operable
Ensures adequate heat removal from the Core should a single failure occur

c. One (1) RHR Shutdown Cooling Subsystem must be operable
Provides adequate circulation to prevent thermal stratification

d. One (1) RHR Shutdown Cooling Subsystem or Alternate Method of heat removal must be operable
Ensures adequate heat removal AND coolant circulation

86) *PV:1.0

*** REFER TO ATTACHMENT #4 TO ANSWER THE FOLLOWING ***

Plant conditions are as follows:

- RCP/F leg of SAMP-1, Sheet 1 has been entered
- The Reactor was shutdown 2 hours ago
- Core debris has not breached the RPV
- RPV level is -325" and steady
- RPV pressure is 850 psig and steady
- RCIC is injecting at 600 gpm
- All other injection sources are unavailable
- Suppression Pool level is 23'
- Suppression Pool pressure is unknown

WHICH ONE of the following identifies the RPV and Primary Containment Flooding strategy required by Table RPC/F-1 for the given plant conditions?

a. SAMP-1, Sheet 3

b. SAMP-1, Sheet 4

c. SAMP-1, Sheet 5

d. SAMP-1, Sheet 7

87) *PV:1.0

*** REFER TO ATTACHMENT #5 TO ANSWER THE FOLLOWING ***

Unit 2 conditions are as follows:

- Reactor Pressure is 800 psig
- Suppression Pool temperature is 190°F and rising slowly
- Suppression Pool level is 22 feet and lowering slowly

WHICH ONE of the following describes the required action?

a. Perform a Reactor Blowdown per T-112

b. Rapidly depressurize the Reactor with the Bypass Valves

c. Depressurize the Reactor to maintain on the safe side of Curve SP/T-1, Heat Capacity Temperature Limit regardless of cooldown rate

d. Depressurize the Reactor to maintain on the safe side of Curve SP/T-1, Heat Capacity Temperature Limit without exceeding cooldown rate limits

88) *PV:1.0

Unit 1 conditions are as follows:

- 20% power
- Main Turbine roll to rated speed is in progress

Main Turbine speed reaches 1944 rpm

WHICH ONE of the following describes the status of the Main Turbine valves? (valves are full open or full closed)

	TSVs	TCVs	ISVs	IVs
a.	Closed	Closed	Closed	Closed
b.	Open	Closed	Open	Closed
c.	Open	Closed	Open	Open
d.	Open	Open	Open	Open

89) *PV:1.0

Unit 2 conditions are as follows:

- An ATWS is in progress
- RPV pressure is 1050 psig
- SLC Tank level is 3800 gallons

All Standby Liquid Control pumps are manually started, with the following indications:

	"2A"	"2B"	"2C"
Squib Indicating Light:	ON	OFF	OFF
SLC Pp Discharge Pressure:	1100 psig	1000 psig	1200 psig

WHICH ONE of the following identifies which pump(s) is/are injecting Boron into the RPV?

a. "2A" only

b. "2B" only

c. "2C" only

d. "2B" and "2C" only

90) PV:1.0

The Main Control Room must be abandoned due to a fire in the Cable Spreading Room

WHICH ONE of the following immediate actions are required prior to leaving the Main Control Room?

a. Manually Start HPCI

b. Transfer House Loads

c. Close Main Steam Isolation Valves

d. Trip both Reactor Recirculation Pumps

91) *PV:1.0

Plant conditions are as follows:

- The Control Room Supervisor (CRS) has delegated completion of GP-3, "Normal Plant Shutdown" for Unit 1 to an Outage Supervisor
- During the Unit 1 shutdown, a problem requires entry into T-103, SECONDARY CONTAINMENT CONTROL
- Unit 2 is operating at 100% power

WHICH ONE of the following describes the responsibility for command and control authority on Units 1 and 2?

	Unit 1	Unit 2
a.	Outage Supervisor	CRS
b.	Shift Manager	CRS
c.	Outage Supervisor	Shift Manager
d.	CRS	Shift Manager

92) PV:1.0

WHICH ONE of the following situations is controlled with a Troubleshooting, Rework & Testing (TRT) Form?

a. Mod Acceptance Testing the "B" RWCU Pump following installation of a new design pump seals

b. Manually throttling RHRSW flow through the RHR Heat Exchangers for baseline flow determinations

c. Station Work Order requiring removal of a fuel injector from the D11 DG for use on the D13 DG

d. D14 LOCA/LOOP Plant Evolution/Special Test (PEST)

93) PV:1.0

With Unit 2 operating at 100%, a review of Core Thermal Limits reveals the following conditions:

	BUNDLE #			
LIMIT	1	2	3	4
MAPRAT	0.992	0.997	0.996	0.998
MFLCPR	0.997	1.002	1.001	1.003
MFLPD	0.893	0.909	0.902	0.912

WHICH ONE of the following describes Core status?

a. The Core is not protected from Transition Boiling

b. Critical Heat Flux has been exceeded in bundles 2, 3 and 4

c. The 1% Plastic Strain Limit has been exceeded for bundles 2, 3, and 4

d. The Core is not protected from exceeding 2200°F if a Large Break LOCA occurs

94) PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- Scram Air header pressure is 68 psig AND lowering slowly

No operator action is taken

WHICH ONE of the following describes the response of the Control Rod Drive Hydraulic (CRDH) System components?

	Control Rods	CRD Flow Control Valve
a.	Remain as is	Fails full open
b.	Drift in	Fails full open
c.	Remain as is	Fails closed
d.	Drift in	Fails closed

95) PV:1.0

Plant conditions are as follows:

- 100% power
- RPV level is 35"
- Feedwater system is in Automatic, 3-element control

"C" Feed Flow Detector fails downscale

WHICH ONE of the following describes Feedwater System response and final steady state RPV level?

a. "C" Reactor Feed Pump will lock-up, higher than 35"

b. "C" Reactor Feed Pump will speed up, lower than 35"

c. All Reactor Feed Pumps will speed up, higher than 35"

d. All Reactor Feed Pumps will speed up, lower than 35"

96) *PV:1.0

Unit 1 conditions are as follows:

- 100% power
- 101-D11 breaker is closed and "Red flagged"
- 201-D11 breaker is open and "Green flagged"

101-D11 breaker trips

WHICH ONE of the following describes 4KV system status one (1) minute later?

	D11 Diesel Generator	Diesel Output breaker
a.	Running	Closed
b.	Running	Open
c.	Not running	Closed
d.	Not running	Open

97) *PV:1.0

The D14 Emergency Diesel Generator (EDG) is synchronized to the 201 Bus

RPV level drops to -135"

WHICH ONE of the following conditions will cause D14 EDG to trip?

a. Generator Differential Overcurrent

b. Low Jacket Water pressure

c. Low Lube Oil pressure

d. Low ESW flow

98) PV:1.0

Unit 2 is operating at 100% power when a Station Blackout occurs

WHICH ONE of the following RPV level instruments is available?

a. LR-42-2R615, Fuel Zone Recorder

b. XR-42-2R623B, "B" Wide Range Recorder

c. LI-42-2R606C, "C" Narrow Range Indicator

d. LI-42-2R605, Shutdown Range Indicator

99) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 5
- "2B" RHR pump is in Shutdown Cooling
- "0D" RHRSW pump is in service

The "B" RHRSW Loop Rad Monitor fails upscale

WHICH ONE of the following describes RHRSW system response to the conditions stated above?

	"2B" RHRHX (SW side)	"0D" RHRSW pump
a.	isolates	trips
b.	isolates	continues to run
c.	does not isolate	trips
d.	does not isolate	continues to run

100) PV:1.0

Unit 2 conditions are as follows:

- An ATWS is in progress
- Standby Liquid Control Pumps failed to start manually or automatically
- Alternate Rod Insertion depressurized the Scram Air Header
- Reactor power is 48%

WHICH ONE of the following TRIP procedures are required?

a. T-212, BYPASSING SQUIB VALVES FOR SLC INJECTION

b. T-240, MAXIMIZING CRD FLOW FLOW AFTER SHUTDOWN DURING EMERGENCY CONDITIONS

c. T-213, INDIVIDUAL CONTROL ROD SCRAM/SOLENOID DE-ENERGIZATION

d. T-209, INJECTION FROM THE STANDBY LIQUID CONTOL STORAGE TANK WITH THE RCIC SYSTEM

SRO QUESTION ATTACHMENTS:

ATTACHMENT	QUESTION No.
1.	Q# 38
2.	Q# 49
3.	Q# 51
4.	Q# 86
5.	Q# 87

ATTACHMENT 1

Q#38

EXHIBIT 1

GUIDELINES FOR SCHEDULING ONLINE WORK

Note: These recommendations are intended to be used as guidance for planning and scheduling system outage windows which could impact either plant capability or incurred risk. Deviations from these recommendations can be made pending a review of the specific circumstances of the maintenance activity (i.e., job complexity, available resources, etc.). These guidelines apply for both emergent and scheduled activities.

1. **SYSTEMS TO BE WORKED 24 HOURS PER DAY TO AN OPERABLE STATUS**

   a. All TSA/LCO's with a remaining duration of 72 HOURS or less

   b. The following PSA risk significant systems should be worked 24 hours per day.

   - Start-up Power Sources - when less than 2 available
   - RHR Heat Exchanger inoperable
   - RCIC (Reactor Core Isolation Cooling)
   - HPCI (High Pressure Coolant Injection)
   - ESW Loop (entire loop unavailable)
   - Diesel Generators and associated support systems

   c. The following systems which may affect plant reliability should be worked 24 hours per day.

   - Reactor Protection System (Half Scram)
   - Standby Gas Treatment System
   - RWCU system activities which require all pumps or both Demins out of service (plant chemistry impact)
   - PCIS System (Half Isolation)

   d. Conditions causing a loss of generating capacity (eg., Circ Pump, Condensate Pump, Feedwater Train)

   e. Systems which cause entry into a Chemistry Action Level 2 per the applicable chemistry procedure

2. **SYSTEMS TO BE WORKED AT LEAST 2 SHIFTS PER DAY (16 hours) TO AN OPERABLE STATUS**

Note: A 7 day TSA/LCO should be worked 24 hours per day once the point is reached where there is less than 72 hours remaining on the action.

Q#38

a. All 7 DAY TSA/LCO's

b. The following PSA Risk Significant systems:

- RHR LPCI Loop (LGS only)

c. The following systems which may affect plant reliability should be worked 2 shifts per day:

- Drywell chillers - due to chiller reliability and the transient associated with the loss of the operating train.
- MCR chillers - due to chiller reliability and the transient associated with the loss of the operating train.
- RECW and TECW trains (LGS) / RBCCW and TBCCW (PB) - (due to transient associated with loss of the operating train)
- EHC Train (plant reliability)
- CRD (plant reliability)
- Service Water Train (plant reliability)
- RWCU activities which remove one Demineralizer from service (plant chemistry impact)
- Systems which enter into Chemistry Action Level 1

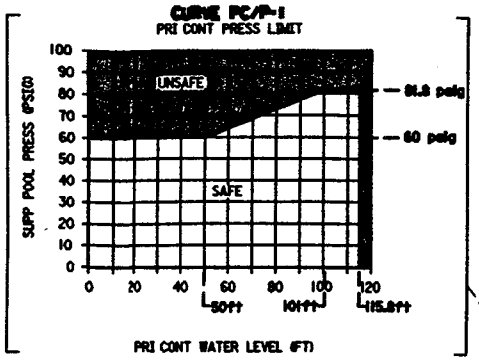
3. **SYSTEMS TO BE RESTORED WITHIN THE SCHEDULED WORK WEEK**

Note: The following systems should be worked expeditiously to minimize system or train unavailability.

All 30 Day and 45 Day LCO/TSA's
Instrument Air/Service Air Train
Rx Protection System
DC Divisional Power and Battery Chargers
Stator Coolant Train
CAC
Standby Liquid Control Train (LGS only)
Toxic Gas Analyzer (LGS only)
Chlorine Detection (LGS only)
Spray Pond HVAC Train (LGS only)

ATTACHMENT 2

Q#49



CONTAINMENT LEVEL IN FEET

	_____	PSIG SUPP POOL PRESS ON PR57-R01 (BLUE PEN)
MINUS (-)	_____	PSIG PRI CONT PRESS ON PR57-R01 (RED PEN)
EQUALS (=)	_____	ΔPSIG
TIMES (X)	2.3	FT/PSIG
EQUALS (=)	_____	FT
PLUS (+)	26.8	FT
EQUALS (=)	_____	FT CONTAINMENT LEVEL

TABLE PC/P-1

SUPP POOL/DW SPRAY SUCT SOURCE

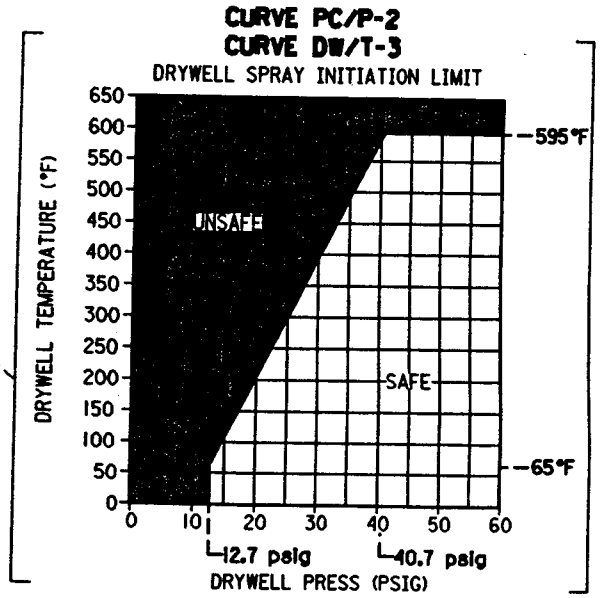
CONDITION	SUCTION SOURCE
On safe side of Curve PC/P-1	• Internal (Supp Pool) preffered • External (RHRSW OR Fire Water)
On unsafe side of Curve PC/P-1	Internal (Supp Pool) ONLY

Determine Supp Pool/DW spray suct source per Table PC/P-1

PC/P-4

IF on safe side of Curve PC/P-2
AND
Supp Pool level is below 38.7 ft,
THEN spray DW per T-225
UNLESS required for core cooling

PC/P-9



ATTACHMENT 3
Q#51
5.0 Radioactivity Release

5.1 Effluent Release and Dose

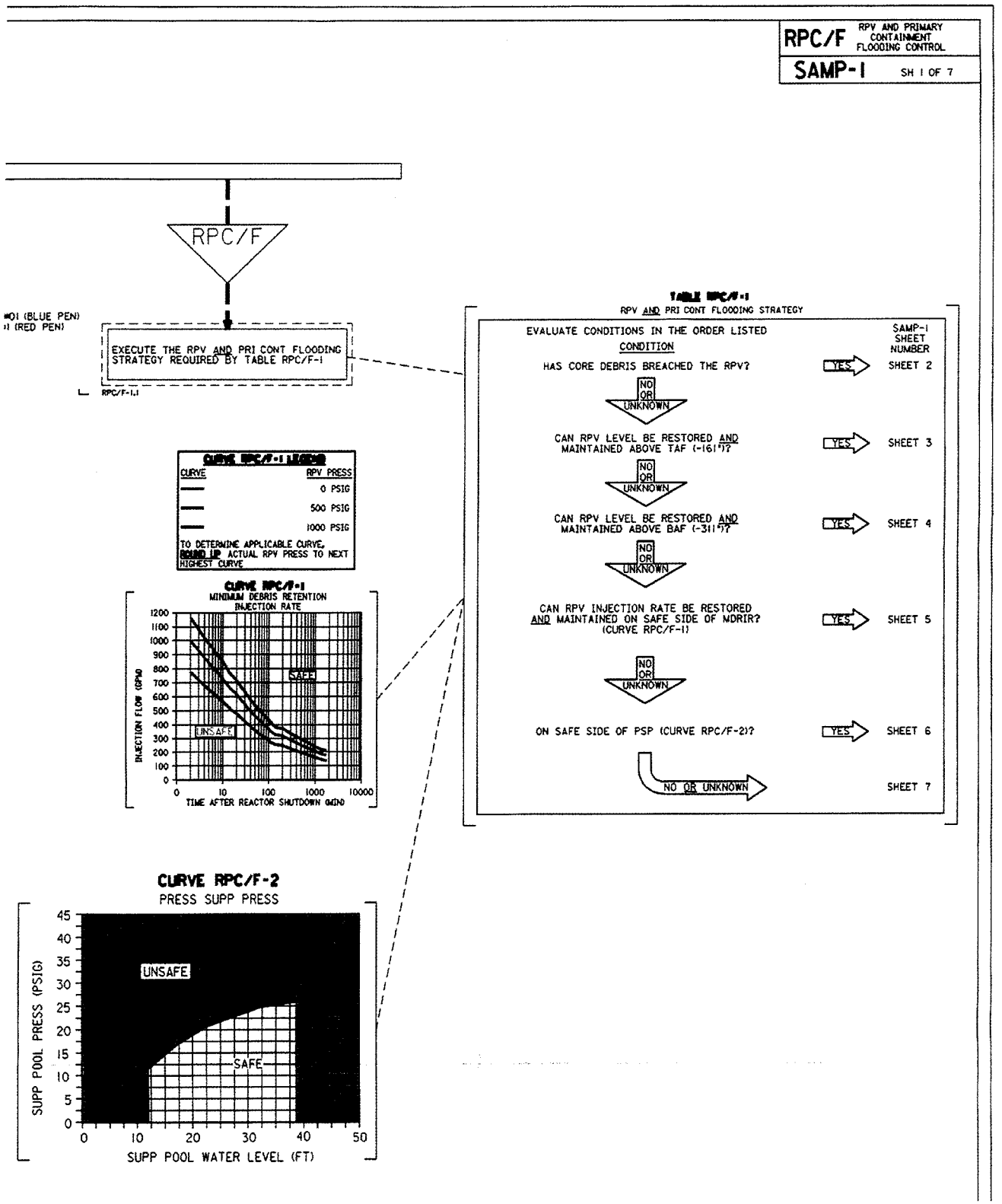
CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	IC Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Radiological Technical Specifications for 60 Minutes or Longer **5.1.1.a** Applicable Opcons: ALL A valid reading on one or more of the following radiation monitors that exceeds **TWO TIMES** the HiHi alarm setpoint value for ***> 60 minutes:*** North Stack, South Stack, Radwaste Discharge, Service Water, RHRSW **AND** Calculated maximum offsite dose rate using computer dose model exceeds ***0.114 mRem/hr TPARD OR 0.342 mRem/hr child thyroid CDE*** based on a 60 minute average Note: If the required dose projections cannot be completed within the 60 minute period, then the declaration must be made based on the valid sustained monitor reading. **5.1.1.b** Applicable Opcons: ALL Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates exceeding **TWO TIMES** Tech Specs (ODCM 3.2.2 and 3.2.3) for ***> 60 minutes***
ALERT	IC Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times Radiological Technical Specifications for 15 Minutes or Longer **5.1.2.a** Applicable Opcons: ALL A valid reading on one or more of the following radiation monitors that exceeds **TWO HUNDRED TIMES** the HiHi alarm setpoint value for ***> 15 minutes:*** North Stack, South Stack, Radwaste Discharge, Service Water, RHRSW **AND** Calculated maximum offsite dose rate exceeds **11.4 mRem/hr TPARD OR 34.2 mRem/hr child thyroid CDE** based on a 15 minute average Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading. **5.1.2.b** Applicable Opcons: ALL Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates exceeding **TWO HUNDRED TIMES** Tech Specs (ODCM 3.2.2 and 3.2.3) for ***> 15 minutes***

ATTACHMENT 3
Q#51

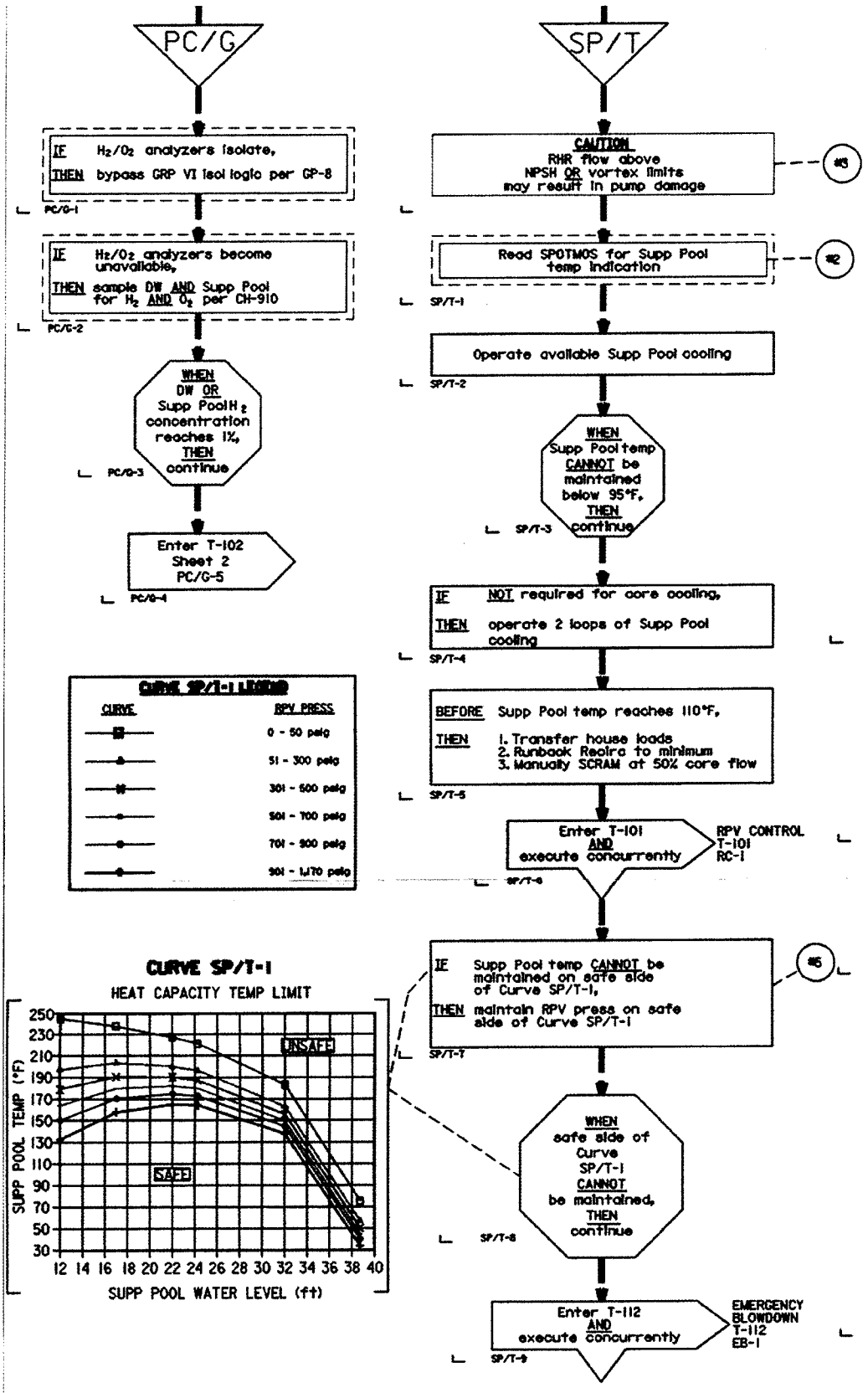
SITE AREA EMERGENCY	**IC** Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mR Whole Body or 500 mR Child Thyroid for the Actual or Projected Duration of the Release **5.1.3** Applicable Opcons: ALL A valid reading on one or more of the following radiation monitors that exceeds or is expected to exceed the value shown for ***> 15 minutes*** AND Dose Projections are not available: North Stack 4.16E+6 µCi/second South Stack 2.25E-3 µCi/cc Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading. **OR** Projected offsite dose using computer dose model exceeds ***100 mRem TPARD*** OR ***500 mRem*** **child thyroid CDE** **OR** Analysis of Field Survey results indicate site boundary whole body dose rate exceeds ***100 mRem/hr*** expected to continue for more than one hour, OR Analysis of Field Survey results indicate child thyroid dose commitment of ***500 mRem*** for one hour of inhalation
GENERAL EMERGENCY	**IC** Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity that Exceeds 1000 mR Whole Body or 5000 mR Child Thyroid for the Actual or Projected Duration of the Release Using Actual Meteorology **5.1.4** Applicable Opcons: ALL A valid reading on one or more of the following radiation monitors that exceeds or is expected to exceed the value shown for ***> 15 minutes*** AND Dose Projections are not available: North Stack 4.16E+7 µCi/second South Stack 2.25E-2 µCi/cc Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading. **OR** Projected offsite dose using computer dose model exceeds ***1000 mRem TPARD*** OR ***5000 mRem*** **child thyroid CDE** **OR** Analysis of Field Survey results indicate site boundary whole body dose rate exceeds ***1000 mRem/hr*** expected to continue for more than one hour, OR Analysis of Field Survey results indicate child thyroid dose commitment of ***5000 mRem*** for one hour of inhalation *****PAR***** Evacuate 2 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 2-5 miles.

NOTE: CDE = Committed Dose Equivalent, TPARD = Total Protective Action Recommendation Dose

ATTACHMENT 4
Q# 86



ATTACHMENT 5
Q#87



2000 INITIAL LICENSE WRITTEN EXAM ANSWER SHEET

Facility: LGS Date: 3/31/2000 Exam Level: SRO Name: KEY

(Black ink only, Circle your choice, Write corrections on line)

1.	a	b	**c**	d	____	✓26.	a	b	**c**	d	____
2.	**a**	b	c	d	____	27.	a	**b**	c	d	____
3.	a	b	c	**d**	____	✓28.	a	**b**	c	d	____
4.	a	b	c	**d**	____	29.	a	b	**c**	d	____
5.	**a**	b	c	d	____	30.	a	b	**c**	d	____
6.	a	**b**	c	d	____	31.	a	b	**c**	d	____
7.	a	b	**c**	d	____	32.	**a**	b	c	d	____
✓8.	a	b	**c**	d	____	33.	**a**	b	c	d	____
9.	**a**	b	c	d	____	34.	a	**b**	c	d	____
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11.	a	b	**c**	d	____	36.	a	b	**c**	d	____
12.	a	b	c	**d**	____	✓37.	a	b	**c**	d	____
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19.	a	b	c	**d**	____	44.	a	b	c	**d**	____
20.	a	**b**	c	d	____	45.	a	b	c	**d**	____
✓21.	a	b	c	**d**	____	46.	a	b	**c**	d	____
22.	a	b	**c**	d	____	47.	a	b	**c**	d	____
23.	**a**	b	c	d	____	48.	a	**b**	c	d	____
24.	a	b	**c**	d	____	✓49.	**a**	b	c	d	____
25.	**a**	b	c	d	____	50.	a	b	c	**d**	____

2000 INITIAL LICENSE WRITTEN EXAM ANSWER SHEET

Facility: LGS Date: 3/31/2000 Exam Level: SRO Name: KEY

(Black ink only, Circle your choice, Write corrections on line)

✓	51.	a	(b)	c	d		76.	a	b	(c)	d	
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✓	55.	a	b	(c)	d		80.	a	b	(c)	d	
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	59.	a	b	c	(d)		84.	(a)	b	c	d	
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	61.	a	b	(c)	d		✓	86.	a	b	(c)	d	
	62.	a	(b)	c	d		✓	87.	(a)	b	c	d	
	63.	(a)	b	c	d		88.	a	(b)	c	d	
	64.	a	b	(c)	d		89.	a	b	(c)	d	
	65.	a	b	c	(d)		✓	90.	a	b	(c)	d	
	66.	a	b	c	(d)		✓	91.	(a)	b	c	d	
	67.	a	(b)	c	d		✓	92.	a	(b)	c	d	
✓	68.	a	(b)	c	d		93.	(a)	b	c	d	
✓	69.	a	b	(c)	d		94.	a	b	~~(c)~~ DW	(d)	
✓	70.	(a)	b	c	d		95.	a	b	(c)	d	
	71.	a	(b)	c	d		96.	a	(b)	c	d	
	72.	a	b	c	(d)		97.	(a)	b	c	d	
✓	73.	(a)	b	c	d		98.	a	b	(c)	~~(d)~~ DW	
	74.	a	b	(c)	d		99.	a	b	(c)	d	
	75.	(a)	b	c	d		✓	100.	a	b	c	(d)	

Attachment 2

RO WRITTEN EXAM W/ANSWER KEY

LIMERICK GENERATING STATION

2000 NRC LICENSE EXAM

REACTOR OPERATOR

WRITTEN

1) PV:1.0

Unit 1 plant conditions are as follows:

- Reactor power is 100%
- RPV level is +35"
- Drywell pressure is 0.3 psig

A blown fuse has caused an inadvertent DWCW Inboard valve isolation.

WHICH ONE of the following identifies the "1A" Recirc pump component that has lost cooling water supply?

a. motor oil cooler

b. seal oil cooler

c. motor air cooler

d. seal air cooler

2) *PV:1.0

Unit 1 conditions are as follows:

- 100% power
- Plant Air systems are in a normal full power line-up
- Both "1A" and "1B" Instrument Air Receiver pressures are 89 psig
- Unit 1 Service Air Receiver pressure is 94 psig
- No Operator action is taken

Later, "1A" and "1B" Insrument Air Receiver pressures indicate 94 psig and 98 psig respectively with both slowly rising

WHICH ONE of the following describes the status of the Plant Air System?

a. Both Instrument Air compressors are running fully loaded

b. Service Air has automatically aligned to supply the "1A" Instrument Air header

c. The Backup Service Air compressor has automatically aligned to supply the "1B" Instrument Air header

d. The "1A" Instrument Air compressor is running fully loaded and the "1B" Instrument Air compressor is running unloaded

3) *PV:1.0

Plant conditions are as follows:

- A Loss of Offsite Power has occurred
- All 4KV Safeguard Buses are energized

WHICH ONE of the following identifies a system capable of supplying water flow directly to the Containment Unit Coolers?

a. Service Water

b. Drywell Chilled Water

c. Emergency Service Water

d. Reactor Enclosure Cooling Water

4) PV:1.0

WHICH ONE of the following systems would automatically initiate and extinguish a Class "A" fire in the Unit 2 Cable Spread Room?

a. Halon

b. Cardox

c. Protein foam

d. Wet-pipe sprinkler

5) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor power is 100%
- RCIC is aligned for auto injection

An electrical fault results in the complete loss of DIVISION 3, 125 VDC.

WHICH ONE of the following describes the effect on RCIC operation, if RPV level drops to -45"?

a. Exhaust Line Vacuum Breaker Inboard isolation valve (HV49-1F084) automatic isolation is disabled

b. High RPV water level automatic system shutdown is disabled

c. Low RPV water level automatic system start is disabled

d. MCR manual isolation pushbutton is disabled

6) *PV:1.0

Unit 2 conditions are as follows:

- GP-3, Reactor Shutdown is in progress
- Reactor Mode switch is in "RUN"
- The Main Turbine is tripped
- APRM indications are as follows:

Channel	Reading
2A	12%
2B	11%
2C	16%
2D	13%
2E	12%
2F	14%

The Reactor Mode Switch is moved to the "Startup" position.

WHICH ONE of the following describes the APRM Withdraw Block status and RPS Scram signal response?

	Withdraw Block	RPS scram signal
a.	Yes	Full
b.	Yes	Half
c.	No	Full
d.	No	Half

7) *PV:1.0

Unit 2 plant conditions are as follows:

- RPV level is -140"
- RPV pressure is 600 psig
- D22 Safeguard 4KV bus is de-energized due to a bus lockout
- No operator actions have been taken

RPV pressure drops to 200 psig

WHICH ONE of the following describes the status of the "2B", "2D" Core Spray pumps, and "2B" Loop CS Inboard Injection valve (HV52-2F037)?

	"2B" CS Pump	"2D" CS Pump	HV52-2F037
a.	On	Off	Closed
b.	On	Off	Open
c.	Off	On	Closed
d.	Off	On	Open

8) PV:1.0

Unit 1 conditions are as follows:

- HPCI is operating in Pressure Control Mode (CST to CST)

WHICH ONE of the following conditions will result if HPCI turbine speed is maintained at 2000 rpm for a prolonged period of time?

a. Vacuum pump cavitation

b. Steam exhaust valve chatter

c. CST suction line water hammer

d. Booster pump bearing overheating

9) *PV:1.0

Unit 2 conditions are as follows:

- The MSIVs are closed
- Reactor pressure is 880 psig
- Both Primary Containment Instrument Gas Receivers are depressurized
- No Alternate pneumatic supplies are available

WHICH ONE of the following identifies an SRV available for RPV cooldown and where it can be operated from?

a. "2A" from the MCR

b. "2J" from the MCR

c. "2K" from the Remote Shutdown Panel

d. "2S" from the Remote Shutdown Panel

10) PV:1.0

Unit 1 Plant conditions are as follows:

- Feedwater System flushing is in progress
- Reactor Feed Pump Turbine Windmilling protection is active for all RFPTs (Keylock switches in "BYPASS")

"1A" RFPT speed rises to 700 rpm

WHICH ONE of the following describes the response of the Reactor Feedwater System?

a. Only "1A" RFP Suction valve closes

b. Only "1A" RFP Discharge valve closes

c. All RFP Suction valves close

d. All RFP Discharge valves close

11) *PV:1.0

ESW is in a normal valve alignment with:

- SPRAY/BYPASS SELECT switches, HSS-12-16A-1(C-1,B,D), in "SPRAY"
- POND/TWR 1(2) SELECT switches, HSS-12-15A-1(C-1,B,D), are normal after "SPRAY POND"
- AUTO VLV LINEUP BYPASS switches, HSS-12-19A(B,C,D), are in "NORM"

D12 Diesel automatically starts

Thirty (30) minutes later, the "B" SPRAY/BYPASS SELECT switch, HSS-12-016B, is placed in "BYPASS"

WHICH ONE of the following describes the status of "A" and "B" Loop ESW return flows to the Spray Pond?

	"A" Loop return to Spray Pond	"B" Loop return to Spray Pond
a.	isolated	thru Bypass only
b.	thru Bypass only	isolated
c.	thru Bypass only	thru Bypass only
d.	isolated	isolated

12) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor power is 80%
- Reactor pressure is 960 psig
- "1A" CRD pump is in service
- All Scram Accumulator Trouble lights are out

Control rod 30-31 Scram Inlet (XV-47-1-26) valve fails open

WHICH ONE of the following states the initial sources of differential pressure across rod 30-31 and its response?

	High pressure Supply	Low pressure Exhaust	Response
a.	RPV pressure	Scram Discharge Volume	drift in
b.	Accum. N2 gas	RPV pressure	no movement
c.	RPV pressure	Scram Discharge Volume	no movement
d.	Accum. N2 gas	RPV pressure	drift in

13) *PV:1.0

Unit 2 conditions are as follows:

- Reactor power is 100%
- A high radiation condition occurs at the outside air intake to the Control Room Ventillation System

Control Room Ventillation Rad Monitor Channel "A" fails to detect the high rad condition.

WHICH ONE of the following describes "A" CREFAS (Control Room Emergency Fresh Air Supply) Fan response and MCR ventillation?

a. WILL automatically start, MCR supplied with some outside air

b. WILL automatically start, MCR supplied with recirculated air

c. WILL NOT automatically start, MCR supplied with recirculated air

d. WILL NOT automatically start, MCR supplied with some outside air

14) *PV:1.0

WHICH ONE of the following identifies the Unit 1 and Unit 2 RHR loops which return directly to the Fuel Pool in Fuel Pool Cooling and Cleanup Assist Mode?

	Unit 1	Unit 2
a.	A	A
b.	A	B
c.	B	A
d.	B	B

15) PV:1.0

Unit 1 Containment purge is in progress per T-228, Inerting/Purging Primary Containment.

WHICH ONE of the following methods must be manually isolated if the SOUTH STACK HI-HI RADIATION annunciator alarms?

a. Drywell Purge with Air

b. Suppression Pool Purge with Air

c. Drywell Inerting with Nitrogen (Hi Flow Mode)

d. Suppression Pool Inerting with Nitrogen (Low Flow Mode)

16) *PV:1.0

Unit 1 plant conditions are as follows:

- OPCON 1
- 18% power
- Power assension is in progress
- Main Condenser vacuum is 28.5" Hg Vac

Main Condenser vacuum drops then stablizes at 10.5" Hg Vac.

RPV water level is maintained at 35"

WHICH ONE of the following lists automatic plant response?

a. Main Turbine trip, Reactor scram

b. Main Turbine trip, RFPTs trip

c. MSIV isolation, Reactor scram

d. RFPTs trip, MSIV isolation

17) *PV:1.0

The following events have occurred:

- The Main Turbine is tripped
- Reactor power is 60%

WHICH ONE of the following states a required pressure control strategy per T-101, RPV CONTROL, and the reason for it?

a. Stablize RPV pressure with HPCI to minimize heat input into the Suppression Pool

b. Reduce RPV pressure with HPCI to minimize operation of Safety Relief Valves

c. Reduce RPV pressure with Turbine Bypass Valves to minimize heat input into the Suppression Pool

d. Stablize RPV pressure with Safety Relief Valves to minimize power fluctuations

18) *PV:1.0

The following events have occured:

- A Feedwater level control failure has occured
- RPV level is +125"
- RPV pressure is 675 psig and rising
- MSIVs are closed

OT-110, REACTOR HIGH LEVEL, directs RPV pressure be maintained below 700 psig.

WHICH ONE of the following identifies the SRV to manually open and the reason why?

a. "K", minimize potential for tailpipe break

b. "B", minimize potential for tailpipe break

c. "K", prevent uneven heat distribution in the Suppression Pool

d. "B", prevent uneven heat distribution in the Suppression Pool

19) *PV:1.0

Plant conditions are as follows:

- 92% power
- RPV level is +35"
- "A" Narrow Range level is selected
- Feedwater level control is 3-element
- Master level controller is in AUTO

"D" Steam Flow transmitter equalizing valve is opened

WHICH ONE of the following describes the effects on RPV water level and plant response?

	RPV level	Plant response
a.	Increases	Main Turbine trips
b.	Decreases	Reactor scrams
c.	Increases	Main Turbine remains on line
d.	Decreases	Reactor remains at power

20) *PV:1.0

Unit 1 plant conditions are as follows:

- 50% power
- Reactor pressure is 1038 psig
- Reactor level is +35"

"1C" Inboard MSIV (HV41-1F022C) slowly drifts fully closed

WHICH ONE of the following describes the maximum allowed power and the bases for that power level?

	Power Level	Bases
a.	75%	Prevents exceeding MCPR thermal limit
b.	75%	Ensures steam flow in remaining steam lines does not exceed 100%
c.	90%	Prevents exceeding MCPR thermal limit
d.	90%	Ensures steam flow in remaining steam lines does not exceed 100%

21) PV:1.0

Unit 2 conditions are as follows:

- An ATWS is in progress
- Reactor power is 27%
- The Main Turbine is tripped

Reactor pressure slowly rises to the setpoint of the lowest set Safety Relief Valve (SRV) causing one SRV to leak

WHICH ONE of the following represents the SRV Tailpipe temperature for the leaking SRV?

a. 212°F

b. 285°F

c. 305°F

d. 566°F

22) *PV:1.0

Unit 2 conditions are as follows:

- Reactor power is 16% and steady
- RPV level was deliberately lowered and stabilized at -56"
- Drywell pressure is 0.3 psig and steady
- RE HVAC Exhaust Vent Duct Rad level is 0.5 mr/hr

NONE of the expected NSSSS Group Isolations have occurred

WHICH ONE of the following NSSSS Group Isolations must be manually initiated?

a. VIIIA, Drywell Chilled Water and Recirc Pump Cooling Water Lines

b. VIIA, Primary Containment Instrument Gas (PCIG) Process Lines

c. VIB, Primary Containment Exhaust to REECE & N2 Block Valves

d. VIIIB, ECCS Process Lines, Suppression Pool Spray Valves

23) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 4
- RPV level is 78"

WHICH ONE of the following identifies instrument calibration condition and the current indicated level as compared to actual level for the "2A" PAM Wide Range Level Indicator?

	Calibration condition	Indicated level
a.	hot	higher than actual
b.	cold	higher than actual
c.	hot	lower than actual
d.	cold	lower than actual

24) PV:1.0

Unit 2 plant conditions are as follows

- Startup is in progress
- The Neutron Monitoring Overlap Surveillance Test is complete

SRMs are being retracted with the following conditions:

IRM CHANNEL	IRM RANGE
A	4
B	3
C	2
D	4
E	BYPASSED
F	3
G	5
H	3

While being retracted, the reading from the "2A" SRM drops to 90 cps.

WHICH ONE of the following describes the expected alarm and rod block response?

	SRM RETRACTED WHEN NOT PERMITTED alarm	Rod Block
a.	on	not enforced
b.	off	enforced
c.	on	enforced
d.	off	not enforced

25) *PV:1.0

Plant conditions are as follows:

- RPV level dropped to -30", then recovered +20"
- RPV pressure is 850 psig
- "A" RHR loop "INITIATION" pushbutton was armed and depressed
- "A" RHR Loop is Spraying the Drywell

RPV level suddenly drops to -200"

WHICH ONE of the following decribes the response of the "A" RHR loop?

a. Remains in Drywell Spray

b. Re-aligns and injects into RPV

c. "A" RHR pump remains running on minimum flow only

d. "A" RHR pump trips, then restarts in LPCI injection mode

26) PV:1.0

Unit 2 plant conditions are as follows:

- Day 19 of a scheduled 29 day refueling outage
- Core Shuffle and Verification are complete
- Vessel Reassembly is in progress

WHICH ONE of the following activities requires direct supervision by a Senior Licensed Operator - Limited to Fuel Handling?

a. Control rod stroke timing in OPCON 4

b. Control rod stroke timing in OPCON 5

c. Source Range Monitor withdraw in OPCON 4

d. Source Range Monitor withdraw in OPCON 5

27) *PV:1.0

Unit 2 plant conditions are as follows:

- A Reactor Startup is in progress
- Reactor power is 16%
- An EHC system failure caused all Turbine Bypass Valves to open
- The MSIVs automatically isolated
- All SCRAM actions are complete
- The pressure Control malfunction was corrected

WHICH ONE of the following describes the sequence of actions required before the MSIVs will re-open from their switches?

a. Perform Isolation Logic reset (Blue/Green)
THEN
Place one MSIV switch in the CLOSE position
THEN
Place it to the OPEN position

b. Place all MSIVs in the CLOSE position
THEN
Perform Isolation Logic reset (Blue/Green)

c. Perform Isolation Logic reset (Blue/Green)
THEN
Place all MSIV switches in the CLOSE position
THEN
Raise Main Steam Line pressure above 756 psig

d. Place all MSIV switches in CLOSE
THEN
Raise Main Steam Line pressure above 756 psig

28) *PV:1.0

The following Unit 1 MCR annunciators alarm:

- 1A/1B RECIRC PUMP MOTOR HI TEMP
- 1A INST AIR COMPRESSOR AFTERCOOLER HI TEMP

WHICH ONE of the following Off-Normal procedures must be entered?

a. ON-113, Loss of RECW

b. ON-117, Loss of TECW

c. ON-119, Loss of Instrument Air

d. ON-115, Loss of Control Enclosure Cooling

29) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor startup is in progress
- Reactor power 12%
- RPV level +35"

Control rod withdraw is in progress

WHICH ONE of the following conditions will result in a rod withdraw block?

a. RBM downscale

b. RPIS "DATA FAULT" alarm

c. RMCS "ACTIVITIES CONTROL DISAGREE" alarm

d. Control rod inserted past its insert limit

30) *PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- Turbine Enclosure HVAC is lost
- A GP-4 shutdown was performed
- "2B" CRD pump is in service

Both Reactor Recirc Pumps are removed from service

WHICH ONE of the following describes how RPV Bottom Head Drain temperature changes over the next two (2) hours and the reason why? (Assume no operator action)

a. Rises due to decreasing flow through the RWCU recirc. pump suction line

b. Drops due to decreasing flow through the RWCU recirc. pump suction line

c. Drops due to decreasing flow through the RWCU bottom head drain line

d. Rises due to decreasing flow through the RWCU bottom head drain line

31) PV:1.0

Unit 1 plant conditions are as follows:

- OPCON 5*
- A fuel bundle is being transferred from the SFP to the Core

WHICH ONE of the following conditions will cause the Refueling Platform to automatically stop before moving over the Core?

a. An SRM fails upscale

b. A Refuel Floor area rad monitor alarm

c. The Reactor Mode switch placed in SHUTDOWN

d. A control rod is selected at the Rod Select Matrix

32) PV:1.0

Plant conditions are as follows:

- 100% power
- 30 scfm Offgas effluent flow
- Offgas dewpoint monitor is reading 40°F

Charcoal Vault refrigeration compressors trip and cannot be restarted.

WHICH ONE of the following describes expected change in the activity of the Offgas effluent and the monitoring location?

	Change in Activity	Monitoring Location
a.	Increase	North Stack
b.	Increase	South Stack
c.	Decrease	North Stack
d.	Decrease	South Stack

33) *PV:1.0

Plant conditions are as follows:

- Unit 1 & Unit 2 REHVAC systems are in operation
- Unit 1 RF HVAC is in operation
- SGD-206-3 (Refuel Floor) is open
- SGD-506-2 (Unit 2 RE) is closed
- SGD-206-1 (Unit 1 RE) is open
- Zone 1 and 3 HVAC Interlocks are cross-tied

WHICH ONE of the following describes the status of RE and Refuel HVAC systems if power is lost to all Unit 1 RE HVAC Exhaust rad monitors?

	Unit 1 RE	Unit 2 RE	Refuel Floor
a.	Isolates	Remains running	Isolates
b.	Isolates	Isolates	Remains running
c.	Remains running	Remains running	Isolates
d.	Remains running	Isolates	Remains running

34) *PV:1.0

Unit 1 plant conditions are as follows:

- 20% power
- 240 MWe

WHICH ONE of the following conditions will generate a Main Turbine trip signal?

a. Main Turbine Lube Oil Bearing header pressure drops to 15 psig

b. Thrust Bearing Wear Detector senses displacement of 45 mils

c. Main Condenser vacuum drops to 23" Hg vac

d. Main Turbine Control Valve fails closed

35) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 5
- Spent Fuel Pool to Reactor Well gates are installed
- All Fuel Pool Cooling and Cleanup pumps are in service
- "2A" RHR pump is in Shutdown Cooling

Refuel Bridge LSRO reports Unit 2 Reactor Well level is dropping at one (1) inch per minute.

WHICH ONE of the following describes a makeup method per S53.0.A, RESPONSE TO LOW LEVEL IN FUEL STORAGE POOL OR REACTOR WELL, and the given conditions?

a. Condensate Transfer using hoses from "Refuel Flr Serv Conn" to the SFP

b. Condensate Transfer by opening HV-51-2F017A, "2A" RHR LPCI Inj PCIV (OUTBOARD)

c. Demineralized water makeup to the Skimmer Surge Tanks

d. CST water from the Control Rod Drive Hydraulic system

36) *PV:1.0

Unit 1 plant conditions are as follows:

- Traversing In-Core Probe runs are in progress for OD-1
- "1C" Drive Control Unit is in AUTO mode
- "CORE TOP" white light lit

AC power to NSSSS Group VIII B, TIPS, isolation logic is lost.

WHICH ONE of the following describes "1C" TIP Drive response?

a. Detector remains at present location, ball valve closes

b. Detector remains at present position, shear valve actuates

c. Detector withdraws to Shield, ball valve closes

d. Detector withdraws to Indexer, shear valve actuates

37) *PV:1.0

Plant conditions are as follows:

- Reactor startup is in progress
- Control Rod 30-31 is selected and being withdrawn from position 08 to position 12

The following indications are observed:

- Control rod 30-31 position indicates "XX" on the 4-rod display
- Control rod 30-31 position indicates "**" on PMS
- RPIS status light "DATA FAULT" is lit on 10C603 panel

WHICH ONE of the following describes the status of rod 30-31?

a. Scrammed

b. Uncoupled

c. At position 09

d. At a failed reed switch

38) *PV:1.0

Unit 1 plant conditions are as follows:

- 100% power
- The "6A" Feedwater Heater level controller fails causing the Shell Side Drain valve to close

WHICH ONE of the following describes plant response if "6A" Feedwater Heater Shell Side Dump valve fails to open?

a. "5A" Feedwater Heater Bleeder Trip valve closes

b. "6A" Feedwater Heater Bleeder Trip valve closes

c. "5A" Feedwater Heater Extraction Steam Supply valve closes

d. "6A" Feedwater Heater Extraction Steam Supply valve closes

39) *PV:1.0

An electrical fault has caused a loss of AC power to DIV I Battery Charger (1BCA2).

WHICH ONE of the following describes the effect on the DIV I, 125 VDC loads?

a. All are lost immediately

b. Some are lost immediately

c. Some are lost when the battery is fully discharged

d. All are lost when the battery is fully discharged

40) PV:1.0

Activities performed during the past 12 hours include:

- "A" Recirc pump speed was raised from 80% to 85%
- Instrument Air was aligned to feed Instrument Gas headers
- Drywell cooling was maximized

Given the following:

- Drywell pressure is 0.80 psig and rising slowly
- Containment Leak Detector is unchanged

WHICH ONE of the following actions will stop the Drywell pressure rise?

a. Isolate RWCU

b. Secure and isolate "A" Recirc pump

c. Start an additional Drywell Cooler fan

d. Isolate Instrument Air to Instrument Gas headers

41) *PV:1.0

Unit 2 conditions are as follows:

- 90% power
- Both recirc pumps are at 80% speed
- "2B" M-G fluid drive scoop tube lock is ON

"2B" Condensate pump breaker trips

Five (5) minutes later, the "HIGH LIMIT" reset pushbuttons for both Recirc pumps are depressed

(No additional operator actions are performed)

WHICH ONE of the following describes the change(s) in Recirc pumps speed due to the events above?

	"2A" Recirc Pump Speed	"2B" Recirc Pump Speed
a.	increase	increase
b.	no change	no change
c.	increase	no change
d.	no change	increase

42) PV:1.0

Unit 1 plant conditions are as follows:

- 100% power
- RPV pressure is 980 psig
- "1A" CRD pump is blocked for maintenance

An electrical fault causes "1B" CRD pump to trip.

WHICH ONE of the following describes when a reactor scram is required if RPV pressure drops to 890 psig?

a. Immediately

b. After twenty (20) minutes

c. One HCU accumulator becomes inoperable

d. Two HCU accumulators become inoperable

43) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 4
- "2B" Loop of RHR is in shutdown cooling

Reactor level drops to -25"

WHICH ONE of the following describes the final position of the RHR valves below?

	HV51-2F006B (Suction B)	HV51-2F008 (Outboard)	HV51-2F015B (Outboard)
a.	Open	Closed	Closed
b.	Closed	Closed	Closed
c.	Open	Open	Open
d.	Closed	Open	Open

44) *PV:1.0

WHICH ONE of the following describes conditions in which adequate Core cooling is NOT ensured?

a. RPV level -180" and steady, "A" loop Core Spray injecting

b. RPV level -238", ATWS in progress, 5 SRVs open, RPV pressure is 325 psig

c. RPV level -200" and steady, RPV pressure is 200 psig and steady, no injection

d. RPV level unknown, 5 ADS valves open, RPV pressure is 60 psig, Suppression Pool pressure is 23 psig

45) PV:1.0

Unit 1 conditions are as follows:

- 100% power
- Reactor level drops to -15" before being restored to +17"
- 19 Control Rods fully insert
- All other rods are at varying positions
- All blue "SCRAM" lights are lit on the Full Core display

WHICH ONE of the following procedures must be performed to insert the control rods?

a. T-215, De-energization of scram solenoids

b. T-216, Manual isolation and vent of scram air header

c. T-213, Individual control rod scram/solenoid de-energization

d. T-217, RPS/ARI reset and backup method of draining scram discharge volume

46) *PV:1.0

The following events have occurred:

- GP-4, Rapid Plant Shutdown, was performed
- RPV level increased to +62" and was restored to +35"
- RPV pressure is 960 psig

A small break LOCA occurs causing Drywell pressure to rise to 2.3 psig and RPV level to slowly drop to 0.0".

WHICH ONE of the following actions will initiate HPCI injection to the RPV with the conditions stated above?

a. Depress "OPEN" pushbutton on HPCI flow controller

b. Arm and depress the "HPCI INITIATION" pushbutton

c. Depress the "RX LEVEL HIGH RESET" pushbutton

d. Depress the "SEAL-IN RESET" pushbutton

47) PV:1.0

Unit 1 plant conditions are as follows:

- Drywell pressure is 25 psig
- Drywell temperature is 250°F
- RPV level dropped to -79" and has been recovered to +17"
- RPV pressure is 600 psig and steady
- "1B" Loop of RHR is in Suppression Pool spray

"1A" loop of RHR is placed in Drywell Spray

WHICH ONE of the following identifies the status of the "1A" RHR Loop LOCA signal and the HV51-1F017A, "1A" RHR LPCI Inj PCIV (OUTBOARD), valve "Override" light?

	"1A" RHR Loop LOCA Signal	HV51-1F017A "Override" light
a.	present	energized
b.	not present	de-energized
c.	present	de-energized
d.	not present	energized

48) *PV:1.0

Unit 1 Plant Conditions are as follows:

- A fire in the Cable Spreading Room has caused MCR evacuation
- All immediate operator actions are complete
- All Remote Shutdown Transfer switches are in "EMERGENCY"

WHICH ONE of the following interlocks are still <u>enabled</u>?

a. RCIC High Level Trip

b. D11, D12, D13 DG Breaker auto close

c. ESW Return to Spray Pond on "A" ESW Pump start

d. HV-51-1F016A "A" Containment Spray Outboard Isolation Valve" open permissive interlock

49) PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- D23 Safeguard Bus lockout occurs
- RPV level drops to -48"
- Automatic and manual actuation of RPS and RRCS fail

All MCR Standby Liquid Control (SLC) pump switches are placed in RUN

WHICH ONE of the following describes the SLC System response?

a. All pumps start, all Squib valves fire

b. Only "2B" and "2C" pumps start, all Squib valves fire

c. All pumps start, only "2A" and "2B" Squib valves fire

d. Only "2A" and "2B" pumps start, only the "2A" and "2B" Squib valves fire

50) *PV:1.0

Unit 1 plant conditions are as follows:

- Entered OPCON 3, twelve (12) minutes ago, due to Drywell pressure increase to 2.5 psig.
- Main Steam Line rad monitors are trending upward.

WHICH ONE of the following identifies the discharge location and the HVAC filter(s) which are limiting Offsite release rate from Unit 1 HPCI vacuum pump?

	Discharge location	HVAC Filter(s)
a.	South Stack	RERS only
b.	South Stack	REECE only
c.	North Stack	REECE and SBGT
d.	North Stack	RERS and SBGT

51) PV:1.0

An electrical fault has caused a loss of DIV 3, 125 VDC power

WHICH ONE of the following identifies how the RCIC flow controller can be operated from the RSP?

a. Auto only

b. Manual only

c. Auto and Manual

d. No control available

52) *PV:1.0

Unit 1 plant conditions are as follows:

- OPCON 4
- RPV level is +85" on Upset Range
- "1B" Loop of Shutdown Cooling (SDC) is in service

RPV level drops to +55"

WHICH ONE of the following describes the impact on plant operation?

a. Insufficient NPSH for RHR pump operation

b. Inadequate margin to SDC isolation setpoint

c. Valid RPV Coolant Temperature is lost

d. Natural Circulation is lost on a loss of SDC

53) *PV:1.0

Unit 2 plant conditions are as follows:

- DIV 3 Safeguard DC power is lost

WHICH ONE of the following describes the response of DIV 3, 4KV and 480V Safeguard breakers if a protective relay signal is received?

a. Only 4KV breakers will trip

b. Only 480V breakers will trip

c. Both 4KV and 480V breakers will trip

d. Neither 4KV nor 480V breakers will trip

54) *PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- "A" loop of Drywell Chilled Water is in service

D21 4KV bus lockout occurs and Drywell temperature begins rising

WHICH ONE of the following describes the required action to mitigate the conditions above?

a. Start "2B" Drywell Chiller

b. Increase Load setting on "2A" Drywell Chiller

c. Align ESW to "2B" Drywell Chiller

d. Increase Service Water flow to "2A" Drywell Chiller

55) PV:1.0

Unit 2 conditions are as follows:

- 90% power
- The "2B" Recirc Flow Unit is bypassed

A leak on the sensing line to the "2C" Recirc Flow Unit causes its output to indicate low

WHICH ONE of the following choices describes plant response?

a. The "2A" RBM generates a Rod Withdrawal Block

b. The "2B" RBM generates a Rod Withdrawal Block

c. The "2A" APRM generates a Rod Withdrawal Block and Half SCRAM

d. The "2B" APRM generates a Rod Withdrawal Block and Half SCRAM

56) *PV:1.0

Unit 1 is in OPCON 2 with RPV pressure at 650 psig when the following occurs:

"1A" CRD pump trips and "1B" CRD pump will not start

"SEAL LEAKAGE HI FLOW ALARM" is received
"SEAL STAGE HI/LO FLOW ALARM" is received

"1B" Recirc Pump indications are as follows:

- #1 Seal Cavity pressure 650 psig
- #2 Seal Cavity pressure 150 psig

WHICH ONE of the following describes the status of the "1B" Recirc Pump Seals?

	#1 Seal	#2 Seal
a.	normal	failed
b.	normal	normal
c.	failed	failed
d.	failed	normal

57) PV:1.0

Unit 2 plant conditions are as follows:

- Reactor scrammed due to Drywell pressure
- RCIC is being operated for level control
- RPV pressure is 450 psig and steady

Condensate injection raises RPV level to 95"

WHICH ONE of the following describes the response of the RCIC System?

a. HV-49-112, Trip Throttle valve closes

b. HV-49-1F045, Steam Supply valve closes

c. HV-49-1F008, Outboard Isol. valve closes

d. HV-49-1F012, Pump Discharge valve closes

58) *PV:1.0

Plant conditions are as follows:

- SGD-206-1 (Unit 1 RE) is open
- SGD-506-2 (Unit 2 RE) is open
- SGD-206-3 (Refuel Floor) is open
- Unit 2 RF Ventilation is in service
- Zones 1 and 3 HVAC Isolation Interlocks are cross-tied

WHICH ONE of the following conditions will cause an isolation of Unit 1 RE HVAC and Unit 1 RF HVAC?

a. Unit 2 Refuel Floor Vent Exh Rad level at 2.2 mr/hr

b. Unit 1 Refuel Floor Vent Exh Rad level at 1.8 mr/hr

c. Unit 1 Reactor Enclosure Vent Exh Rad level at 1.2 mr/hr

d. Unit 2 Reactor Enclosure Vent Exh Rad level at 2.4 mr/hr

59) PV:1.0

Unit 1 is at 100% power

The following events have occurred:

- DIV 3 STEAM LEAK DET SYS HI TEMP/TROUBLE annunciator alarmed
- DIV 3 Turbine Enclosure - Main Steam Line temperature element, TE25-115C is above trip setpoint reading 175°F and rising

DIVISION 4 Turbine Enclosure - Main Steam Line temperature element, TE25-115D, rises to 190°F?

WHICH ONE of the following identifies MSIV response?

	Inboard MSIVs	Outboard MSIVs
a.	remain open	remain open
b.	close	remain open
c.	remain open	close
d.	close	close

60) *PV:1.0

WHICH ONE of the following tests is required to be documented in the ST/RT Status Log every time it is performed?

a. ST-6-107-760-1, CONTROL ROD EXERCISE

b. ST-6-092-313-1, D13 DG SLOW START OPERABILITY TEST RUN

c. RT-6-046-230-2, 2A AND 2B CRD PUMP PERFORMANCE TEST

d. RT-6-031-751-1, EHC ACCUMULATOR PRESSURE CHECK

61) *PV:1.0

Unit 2 plant conditions are as follows:

- 75% power
- "2A" Reactor Recirc Pump (RRP) was manually tripped and its discharge valve was closed
- Indicated Total Core Flow is 48 Mlb/hr

After five (5) minutes, the "2A" RRP discharge valve is re-opened

WHICH ONE of the following identifies the change in "2B" Recirc Loop Flow when "2A" RRP tripped and Indicated Total Core Flow when the "2A" RRP discharge valve opens?

	"2B" Recirc Loop Flow (due to "2A" RRP trip)	Indicated Total Core Flow (due to "2A" RRP discharge valve open)
a.	Increase	Increase
b.	Decrease	Increase
c.	Increase	Decrease
d.	Decrease	Decrease

62) PV:1.0

Unit 1 plant conditions are as follows:

- A LOCA has occurred
- Automatic ADS blowdown is in progress
- All ECCS pumps auto started
- Reactor pressure is 200 psig and dropping
- Reactor level was recovered to -100"

All RHR pumps are secured

WHICH ONE of the following will stop the ADS blowdown?

a. Stop "1A" and "1C" Core Spray pumps

b. Stop "1C" and "1D" Core Spray pumps

c. Place both AUTO ADS switches in INHIBIT

d. Depress both High Drywell Pressure RESET pushbuttons

63) *PV:1.0

Unit 1 plant conditions are as follows:

- 100% power
- RPS Scram Funtional testing is in progress
- An "A" side RPS Scram signal is manually inserted

The Group "B2" RPS solenoid power fuse blows and Group "B2" indicating light on 10C603 panel deenergizes.

WHICH ONE of the following identifies the status of Control Rods and Scram Discharge Volume (SDV) vent and drain valves ten (10) seconds after the fuse blows, if no operator actions are taken?

	Control Rods	SDV vents and drains
a.	47 rods scram	open
b.	All rods scram	open
c.	47 rods scram	closed
d.	All rods scram	closed

64) *PV:1.0

Unit 1 conditions are as follows:

- A 50% Power ATWS is in progress
- A complete rupture of "A" steam line occurs in the Drywell
- Suppression Pool Water level is 24'

WHICH ONE of the following will result from a complete loss of Drywell Spray?

a. High Suppression Pool temperature requiring an unmonitored Offsite release

b. High Suppression Pool pressure causing Drywell Floor upward differential pressure maximum to be exceeded

c. High Suppression Pool pressure requiring a monitored Offsite release

d. High Suppression Pool temperature causing Drywell Floor upward differential pressure maximum to be exceeded

65) *PV:1.0

Plant conditions are as follows:

- A Reactor Enclosure HVAC High Rad isolation occurs
- "A" Standby Gas Treatment System fan is inoperable
- "B" Standby Gas Treatment System fan starts

The "B" Standby Gas Treatment fan bypass damper is stuck shut

WHICH ONE of the following describes expected steady state Reactor Enclosure differential pressure?

a. 0.00 to +0.15 psid

b. +0.25 psid or greater (more positive)

c. 0.00 to -0.15 psid

d. -0.25 psid or greater (more negative)

66) *PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- 1160 MWe

Main Generator output current drops to 8050 Amps in 25 milliseconds.

WHICH ONE of the following describes automatic plant response to the conditions above?

a. Control valves throttle open to control RPV pressure, Reactor remains at power

b. Intercept valves throttle open to control turbine speed, Reactor remains at power

c. Main Turbine trips after 3 minute delay, Reactor scrams

d. Main Generator lockout, Reactor scrams

67) *PV:1.0

Unit 2 conditions are as follows:

- All running RWCU Pumps have tripped
- HV-44-2F001, RWCU Inboard Isolation valve is closed
- HV-44-2F004, RWCU Outboard Isolation valve is open

WHICH ONE of the following will cause the conditions above?

a. DIV II RRCS initiation

b. Loss of "2A" RPS/UPS power

c. The "2B" Standby Liquid Control pump manually started

d. Reactor Water Clean Up Filter/Demin inlet high temperature trip

68) PV:1.0

Unit 1 conditions are as follows:

- 7% power
- Reactor Mode switch is in "Startup"

The following events occur:

- A steam leak develops on #3 Combined Intermediate Valve
- The Reactor is manually scrammed
- Main Steam Lines "A", "C" and "D" are manually isolated
- Main Steam Line "B" fails to isolate
- RPV level dropped to +20" and was restored to +35"

WHICH ONE of the following TRIP procedures must be entered?

a. T-100 and T-103

b. T-101 and T-103

c. T-101 only

d. T-100 only

69) *PV:1.0

Unit 2 conditions are as follows:

- 50% power
- "2B" RHR Loop is in Suppression Pool Cooling at 8300 gpm

A LOCA drops RPV pressure to 420 psig and raises Drywell pressure to 3.5 psig

WHICH ONE of the following describes "2B" RHR loop conditions?

a. Pump running out

b. Injecting to the RPV

c. Draining to Suppression Pool

d. Suppression Pool cooling secured

70) *PV:1.0

Unit 2 conditions are as follows:

- 100% power
- Both running Reactor Enclosure (RE) Exhaust fans are tripped

The Standby RE Exhaust Fan fails to start

WHICH ONE of the following describes RE and Standby Gas Treatment fan status thirty (30) minutes later with no operator action?

	RE Supply Fans	Standby Gas Treatment Fans
a.	Tripped	Running
b.	Running	Off
c.	Tripped	Off
d.	Running	Running

71) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 1
- 5% power
- Drywell Power Entry Authorization sheet has been approved
- Drywell Entry Team is in the Drywell on 303' elevation
- "2A" and "2B" APRMS Upscale Setdown Trip setpoint is enabled

Reactor power unexpectedly increases to 12%

WHICH ONE of the following describes how the Drywell Entry Team will be protected from increased levels of radiation?

a. RPS Trip system will initiate an immediate full scram

b. The Reactor Operator shall immediately place the Reactor Mode Switch in "SHUTDOWN"

c. The Reactor Operator shall direct the Drywell Control Point to survey the work area

d. The Rod Block Monitor will initiate a control rod withdraw block

72) PV:1.0

The following sequence of events occurs on Unit 2:

- 10:00 REAC ENCL HVAC PANEL 2AC208 TROUBLE alarms
- 10:05 DIV 1 STEAM LEAK DET SYS HI TEMP/TROUBLE alarms
- 10:25 REAC ENCL ST FLOOD DAMPER PNL 10C234 TROUBLE alarms
- 10:30 MOTOR DRIVEN FIRE PUMP RUNNING alarms
- 10:40 RCIC PUMP ROOM FLOOD alarms

WHICH ONE of the following identifies when Initial and Re-Entry into T-103 is required?

	Initial Entry time	Re-entry Time
a.	10:00	10:05
b.	10:05	10:30
c.	10:00	10:25
d.	10:05	10:40

73) *PV:1.0

Unit 2 plant conditions are as follows:

- RPV level is -145"

NONE of the required SE-10, LOCA, actions have been performed

WHICH ONE of the following identifies the plant air compressor(s) capable of starting under the conditions given?

a. Only Backup Service Air

b. Only Unit 2 Instrument and Service Air

c. Only Backup Service Air and Unit 2 Service Air

d. Backup Service Air, Unit 2 Instrument and Service Air

74) *PV:1.0

Unit 1 conditions are as follows:

- OPCON 5*
- Core shuffle to final configuration is in progress per Core Component Transfer Authorization sheet (CCTAS)

The following SRM countrate trends are observed between CCTAS steps #265 and #266:

Time	"1A"	"1B"	"1C"	"1D"
+1 min	70	42	20	55
+2 mins	120	100	45	120
+3 mins	162	102	102	165
+4 mins	200	103	160	175

WHICH ONE of the following SRMs are indicating an inadvertent criticality?

a. "1A"

b. "1B"

c. "1C"

d. "1D"

75) *PV:1.0

Unit 1 conditions are as follows:

- 100% power

The following transient occurs:

- Four (4) SRVs open automatically on high Reactor pressure
- Five (5) control rods are stuck at position 02
- One (1) control rod is stuck at position 48
- All other control rods are full in

WHICH ONE of the following describes plant response?

	RFP Runback To Minimum	ARI Initiates	SLC Injects	RRPs Trip
a.	No	Yes	No	Yes
b.	No	No	Yes	Yes
c.	Yes	Yes	No	No
d.	Yes	Yes	Yes	Yes

76) PV:1.0

Primary Containment Control, T-102 directs the following:

- HPCI is secured if Suppression Pool level cannot be maintained above 18 feet
- RCIC is secured if Suppression Pool level cannot be maintained above 13.5 feet

WHICH ONE of the following explains why HPCI is secured at a higher level than RCIC?

a. HPCI requires a larger volume of water to condense its exhaust steam

b. HPCI exhaust sparger is located at a higher level in the Suppression Pool

c. HPCI exhaust is capable of pressurizing the Primary Containment in excess of Containment design pressure

d. The HPCI High Exhaust Pressure Turbine Trip is set lower than the RCIC High Exhaust Pressure Turbine Trip

77) *PV:1.0

Unit 1 plant conditions are as follows:

- A LOCA is in progress
- RPV level -29" and stable
- RPV pressure is 350 psig and dropping slowly
- Drywell pressure is 25 psig and rising slowly

Fifteen (15) minutes later, the following systems isolation signals are bypassed per TRIP procedures:

- Drywell Chilled Water
- H_2/O_2 Analyzers
- Primary Containment Instrument Gas

WHICH ONE of the following components are prevented from being returned to service based on the conditions given above?

a. H_2/O_2 Analyzers

b. Control Rod Drive pumps

c. Drywell Chilled Water pumps

d. Primary Containment Instrument Gas compressors

78) *PV:1.0

Unit 2 is at 100% power.

The following are observed on Unit 2:

- Sudden rise in Offgas System temperatures
- Sudden drop in Offgas System hydrogen concentration
- The in-service 1st stage Steam Jet Air Ejector (SJAE) air suction valves are closed

WHICH ONE of the following actions is required to prevent an automatic Main Turbine trip?

a. Start the Mechnical Vacuum pump

b. Open the alternate SJAE Train 1st stage air suction valves

c. Reduce power per Reactor Maneuvering Shutdown Instructions

d. Increase the in-service 2nd stage SJAE steam supply to 200 psig

79) *PV:1.0

Unit 1 conditions are as follows:

- 100% power
- An inadvertent 1.68 psig Drywell pressure isolation signal is received

The isolation signals are bypassed and flowpaths restored per GP-8.5, ISOLATION BYPASS OF CRUCIAL SYSTEMS, for:

* PCIG
* Reactor Enclosure Cooling Water
* Drywell Chilled Water
* H_2/O_2 Analyzers

WHICH ONE of the following systems will automatically re-isolate if RPV water level subsequently drops to -149"?

a. Reactor Enclosure Cooling Water

b. Drywell Chilled Water

c. H_2/O_2 Analyzers

d. PCIG to ADS valves

80) *PV:1.0

Unit 1 plant conditions are as follows:

- Offsite power is lost
- D11 Bus Lockout has occurred
- RPV level is 30" and steady
- Drywell pressure is 0.5 psig and steady

Suppression Pool level rises to 25'6"

WHICH ONE of the following T-102, Primary Containment Control, methods can can be used to lower Suppression Pool level for the given conditions?

a. "1A" RHR pump to Radwaste per S51.8.A, SUPPRESSION POOL COOLING/LEVEL CONTROL

b. Suppression Pool Cleanup pump to Radwaste per T-232, SUPP POOL CLEANUP PUMP

c. HPCI to Condensate Storage Tank per T-230, HPCI/RCIC TO CST

d. "1B" RHR pump to Radwaste per T-233, RHR TO RADWASTE

81) PV:1.0

Unit 2 conditions are as follows:

- A Group IA isolation occurred at 100% power
- HPCI is being operated for Reactor pressure control
- RCIC is being operated for Reactor level control

WHICH ONE of the following will disable HPCI pressure control mode?

a. Loss of DIV 4 DC

b. A valid DIV 2 LOCA signal

c. D22 4Kv Bus lockout

d. PCIG isolation

82) PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 2
- All APRM downscales are present
- Control Rod 34-35 is at its withdraw limit of 12

A continuous withdraw signal is applied to control rod 34-35

WHICH ONE of the following describes the Rod Worth Minimizer response?

a. Withdraw motion is prevented

b. Rod motion will stop at position 16

c. An insert block will only be applied after position 48 is reached

d. A withdraw block will only be applied after position 00 is reached

83) *PV:1.0

Unit 1 plant conditions are as follows:

- T-103 has been entered
- T-236, TRANSFERRING REACTOR ENCLOSURE FLOOR DRAIN SUMP TO SUPPRESSION POOL VIA CORE SPRAY SYSTEM, is complete
- HS-61-104, REACTOR ENCL. FLOOR DRAIN SUMP SELECTION SW is in the "HI-HI" position

WHICH ONE of the following describes the operation of the "1A" and "1B" Reactor Enclosure Floor Drain Sump Pumps given the conditions above?

a. both "1A" and "1B" pumps run continuously and will only trip on thermals

b. both "1A" and "1B" pumps run continuously and will trip on a "HI-HI" radiation signal

c. both "1A" and "1B" pumps run based on sump level and will only trip on thermals

d. both "1A" and "1B" pumps run based on sump level and will trip on a "HI-HI" radiation signal

84) *PV:1.0

Unit 1 plant conditions are as follows:

- 33 % power
- Stator Current is 11,000 Amps

Main Generator Bushing cooling flow is lost

WHICH ONE of the following describes plant response?

a. EHC Load Set runback

b. Immediate Main Turbine trip

c. Immediate "1A" Recirc pump trip

d. Sequential trip of both Recirc pumps

85) PV:1.0

Unit 1 conditions are as follows:

- 100% power

The Offgas Guard Bed becomes completely blocked due to water intrusion

WHICH ONE of the following describes how Steam Jet Air Ejector valves respond if no operator action is taken?

a. First stage Steam Supply valves will auto close

b. First stage Air Suction valves will auto close

c. Second stage Steam Supply valve will auto close

d. Second stage Air Suction valve will auto close

86) *PV:1.0

The "1A" RPS & UPS STATIC INVERTER TROUBLE alarm is received due to an output overvoltage condition

WHICH ONE of the following describes plant response?

a. An RPS full Scram signal is generated

b. "1A" RPS & UPS Static Inverter DC Input breaker trips

c. "1A" RPS & UPS Static Switch swaps to its Alternate AC supply

d. "1A" RPS & UPS Static Switch swaps to its Alternate DC supply

87) *PV:1.0

Unit 2 is operating at 100% power

The SCRAM DISCHARGE VOLUME HI LEVEL TRIP annunciator alarms

The System Manager reports:

"All SDV level indicators are reading 70% which is equal to 30 gallons".

WHICH ONE of the following describes required action?

a. Manually scram the Reactor

b. Reduce Reactor power per RMSI

c. Perform T-217, Vent/Drain Scram Discharge Volume

d. Verify all scram Discharge Volume vent/drain valves are closed

88) *PV:1.0

Unit 1 conditions are as follows:

- 20% power
- Main Turbine roll to rated speed is in progress

Main Turbine speed reaches 1944 rpm

WHICH ONE of the following describes the status of the Main Turbine valves? (valves are full open or full closed)

	TSVs	TCVs	ISVs	IVs
a.	Closed	Closed	Closed	Closed
b.	Open	Closed	Open	Closed
c.	Open	Closed	Open	Open
d.	Open	Open	Open	Open

89) *PV:1.0

Unit 2 conditions are as follows:

- An ATWS is in progress
- RPV pressure is 1050 psig
- SLC Tank level is 3800 gallons

All Standby Liquid Control pumps are manually started, with the following indications:

	"2A"	"2B"	"2C"
Squib Indicating Light:	ON	OFF	OFF
SLC Pp Discharge Pressure:	1100 psig	1000 psig	1200 psig

WHICH ONE of the following identifies which pump(s) is/are injecting Boron into the RPV?

a. "2A" only

b. "2B" only

c. "2C" only

d. "2B" and "2C" only

90) *PV:1.0

Unit 1 conditions are as follows:

- 100% power

A complete rupture of the HPCI steam supply line occurs in the Safeguard Valve Room (309) and cannot be isolated

WHICH ONE of the following describes Secondary Containment response?

a. Blowout Panels will open resulting in a monitored and uncontrolled release path

b. Blowout Panels will open resulting in an unmonitored and uncontrolled release path

c. Steam Flooding Dampers will close resulting in an unmonitored and controlled release path

d. Steam Flooding Dampers will close resulting in a monitored and controlled release path

91) PV:1.0

Unit 1 conditions are as follows:

- Plant cooldown is in progress
- "1B" RHR Pump is operating in Shutdown Cooling Mode

Drywell Pressure rises to 2.3 psig

WHICH ONE of the following describes "1B" RHR pump response?

a. Trips with no suction path aligned

b. Continues to run in Shutdown Cooling Mode

c. Trips and suction path re-aligns to Suppression Pool

d. Continues to run and suction path re-aligns to Suppression Pool

92) *PV:1.0

Unit 1 conditions are as follows:

- The D11 Diesel Generator is being synchronized to its 4KV Bus
- The D11 Synchroscope is rotating slow in the FAST direction
- INCOMING Voltage is higher than RUNNING Voltage

WHICH ONE of the following describes the relationship between INCOMING and RUNNING sources?

	D11 DG	D11 Bus
a.	4350 Volts @ 60 Hz	4320 Volts @ 59.5 Hz
b.	4320 Volts @ 60 Hz	4350 Volts @ 59.5 Hz
c.	4320 Volts @ 59.5 Hz	4350 Volts @ 60.0 Hz
d.	4350 Volts @ 59.5 Hz	4320 Volts @ 60.0 Hz

93) *PV:1.0

With Unit 2 operating at 100%, a review of Core Thermal Limits reveals the following conditions:

	BUNDLE #			
LIMIT	1	2	3	4
MAPRAT	0.992	0.997	0.996	0.998
MFLCPR	0.997	1.002	1.001	1.003
MFLPD	0.893	0.909	0.902	0.912

WHICH ONE of the following describes Core status?

a. The Core is not protected from Transition Boiling

b. Critical Heat Flux has been exceeded in bundles 2, 3 and 4

c. The 1% Plastic Strain Limit has been exceeded for bundles 2, 3, and 4

d. The Core is not protected from exceeding 2200°F if a Large Break LOCA occurs

94) *PV:1.0

Unit 2 plant conditions are as follows:

- 100% power
- Scram Air header pressure is 68 psig AND lowering slowly

No operator action is taken

WHICH ONE of the following describes the response of the Control Rod Drive Hydraulic (CRDH) System components?

	Control Rods	CRD Flow Control Valve
a.	Remain as is	Fails full open
b.	Drift in	Fails full open
c.	Remain as is	Fails closed
d.	Drift in	Fails closed

95) PV:1.0

Plant conditions are as follows:

- 100% power
- RPV level is 35"
- Feedwater system is in Automatic, 3-element control

"C" Feed Flow Detector fails downscale

WHICH ONE of the following describes Feedwater System response and final steady state RPV level?

a. "C" Reactor Feed Pump will lock-up, higher than 35"

b. "C" Reactor Feed Pump will speed up, lower than 35"

c. All Reactor Feed Pumps will speed up, higher than 35"

d. All Reactor Feed Pumps will speed up, lower than 35"

96) *PV:1.0

Unit 1 conditions are as follows:

- 100% power
- 101-D11 breaker is closed and "Red flagged"
- 201-D11 breaker is open and "Green flagged"

101-D11 breaker trips

WHICH ONE of the following describes 4KV system status one (1) minute later?

	D11 Diesel Generator	Diesel Output breaker
a.	Running	Closed
b.	Running	Open
c.	Not running	Closed
d.	Not running	Open

97) *PV:1.0

The D14 Emergency Diesel Generator (EDG) is synchronized to the 201 Bus

RPV level drops to -135"

WHICH ONE of the following conditions will cause D14 EDG to trip?

a. Generator Differential Overcurrent

b. Low Jacket Water pressure

c. Low Lube Oil pressure

d. Low ESW flow

98) PV:1.0

Unit 2 is operating at 100% power when a Station Blackout occurs

WHICH ONE of the following RPV level instruments is available?

a. LR-42-2R615, Fuel Zone Recorder

b. XR-42-2R623B, "B" Wide Range Recorder

c. LI-42-2R606C, "C" Narrow Range Indicator

d. LI-42-2R605, Shutdown Range Indicator

99) *PV:1.0

Unit 2 plant conditions are as follows:

- OPCON 5
- "2B" RHR pump is in Shutdown Cooling
- "0D" RHRSW pump is in service

The "B" RHRSW Loop Rad Monitor fails upscale

WHICH ONE of the following describes RHRSW system response to the conditions stated above?

	"2B" RHRHX (SW side)	"0D" RHRSW pump
a.	isolates	trips
b.	isolates	continues to run
c.	does not isolate	trips
d.	does not isolate	continues to run

100) *PV:1.0

Unit 1 plant conditions are as follows:

- 100% power
- Suppression Pool level is 22' 6" and stable
- CST level is 32' and stable
- HPCI is aligned for Automatic Operation

HPCI pump suction is being realigned for a Post Maintenance Test with valves in the following positions:

- HV-55-1F004, CND TNK SUCTION Closed
- HV-55-1F041, SUPP POOL SUCTION Open
- HV-55-1F042, SUPP POOL Closed

Drywell pressure increases to 2.0 psig

WHICH ONE of the following identifies HPCI pump suction valve positions five (5) minutes later, if no operator action is taken?

	HV-55-1F004	HV-55-1F041	HV-55-1F042
a.	closed	open	open
b.	closed	open	closed
c.	open	open	closed
d.	open	closed	closed

2000 INITIAL LICENSE WRITTEN EXAM ANSWER SHEET

Facility: LGS Date: 3/31/2000 Exam Level: RO Name: KEY

(Black ink only, Circle your choice, Write corrections on line)

1.	a	b	**c**	d	____	26.	a	**b**	c	d	____
2.	**a**	b	c	d	____	27.	a	**b**	c	d	____
3.	a	b	c	**d**	____	28.	a	**b**	c	d	____
4.	a	b	c	**d**	____	29.	a	b	**c**	d	____
5.	**a**	b	c	d	____	30.	a	b	**c**	d	____
6.	a	**b**	c	d	____	31.	a	b	**c**	d	____
7.	a	b	**c**	d	____	32.	**a**	b	c	d	____
8.	a	**b**	c	d	____	33.	**a**	b	c	d	____
9.	**a**	b	c	d	____	34.	a	**b**	c	d	____
10.	**a**	b	c	d	____	35.	a	b	c	**d**	____
11.	a	b	**c**	d	____	36.	a	b	**c**	d	____
12.	a	b	c	**d**	____	37.	a	b	c	**d**	____
13.	a	**b**	c	d	____	38.	a	b	c	**d**	____
14.	a	b	**c**	d	____	39.	a	b	**c**	d	____
15.	a	b	c	**d**	____	40.	a	b	c	**d**	____
16.	a	**b**	c	d	____	41.	a	b	**c**	d	____
17.	a	b	c	**d**	____	42.	a	b	c	**d**	____
18.	a	**b**	c	d	____	43.	**a**	b	c	d	____
19.	a	b	c	**d**	____	44.	a	b	c	**d**	____
20.	a	**b**	c	d	____	45.	a	b	c	**d**	____
21.	a	**b**	c	d	____	46.	a	b	**c**	d	____
22.	a	b	**c**	d	____	47.	a	b	**c**	d	____
23.	**a**	b	c	d	____	48.	a	**b**	c	d	____
24.	a	b	**c**	d	____	49.	a	b	c	**d**	____
25.	**a**	b	c	d	____	50.	a	b	c	**d**	____

2000 INITIAL LICENSE WRITTEN EXAM ANSWER SHEET

Facility: LGS Date: 3/31/2000 Exam Level: RO Name: KEY

(Black ink only, Circle your choice, Write corrections on line)

51.	a	b	**c**	d	
52.	a	b	c	**d**	
53.	a	**b**	c	d	
54.	**a**	b	c	d	
55.	a	b	**c**	d	
56.	**a**	b	c	d	
57.	a	**b**	c	d	
58.	**a**	b	c	d	
59.	a	b	c	**d**	
60.	a	**b**	c	d	
61.	a	b	**c**	d	
62.	a	**b**	c	d	
63.	**a**	b	c	d	
64.	a	b	**c**	d	
65.	a	b	c	**d**	
66.	a	b	c	**d**	
67.	a	**b**	c	d	
68.	a	b	c	**d**	
69.	a	b	c	**d**	
70.	a	b	**c**	d	
71.	a	**b**	c	d	
72.	a	b	c	**d**	
73.	a	b	**c**	d	
74.	a	b	**c**	d	
75.	**a**	b	c	d	

76.	a	b	**c**	d	
77.	a	b	c	**d**	
78.	a	b	**c**	d	
79.	a	b	**c**	d	
80.	a	b	**c**	d	
81.	a	**b**	c	d	
82.	**a**	b	c	d	
83.	a	b	**c**	d	
84.	**a**	b	c	d	
85.	a	**b**	c	d	
86.	a	b	**c**	d	
87.	**a**	b	c	d	
88.	a	**b**	c	d	
89.	a	b	**c**	d	
90.	a	**b**	c	d	
91.	~~a~~ B	**b** B	c	d	b
92.	**a**	b	c	d	
93.	**a**	b	c	d	
94.	a	b	c	**d**	
95.	a	b	**c**	d	
96.	a	**b**	c	d	
97.	**a**	b	c	d	
98.	a	b	**c**	d	
99.	a	b	**c**	d	
100.	a	b	**c**	d	