U. S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET/REPORT NOS:	50-352/95-13 (OL) 50-353/95-13 (OL)
LICENSEE:	PECO Energy
FACILITY:	Limerick Generating Station, Units 1 & 2 Sanatoga, Pennsylvania
DATES:	August 7-9, 1995
EXAMINERS:	C. Sisco, Operations Engineer K. Kolaczyk, Operations Engineer W. Eresian, Examiner (NRR)

CHIEF EXAMINER: Carl Sisco 8/24/95

Carl E. Sisco, Operations Engineer
PWR & BWR Sections
Division of Reactor Safety
Date

APPROVED BY: Glenn W. Meyer 9/7/95

Glenn W. Meyer, Chief
PWR & BWR Sections
Division of Reactor Safety
Date

EXECUTIVE SUMMARY

COMBINED EXAMINATION REPORT 50-352/94-16 and 50-353/94-16 (OL)

Three examiners administered initial examinations to three senior reactor operator (SRO) instant applicants during the period of August 7-9, 1995, at Limerick Generating Station, Units 1 and 2.

Operations

All the applicants passed the examination. Due to the small sample size, generic strengths and weaknesses were not noted on the written examination.

During the conduct of the simulator examinations, as well as observing the on shift control room operators, the NRC examiners noted a weakness concerning the operators' response to control room alarms. Specifically, the control room operators did not verbally report, and the control room supervisors did not acknowledge the operators' response to control room alarms in all situations as noted by the NRC examiners. PECO stated that the NRC examiners' observations may indicate that PECO's expectations concerning operator response to control room alarms may not be entirely met. PECO also stated that the NRC examiners' observations would be reviewed, and appropriate corrective actions taken as deemed necessary.

During the administration of the JPMs, the NRC examiners noted two inconsistencies that were related to plant procedures and an inaccurate label on a control room switch. PECO took prompt corrective action to correct the procedure inconsistencies and control room switch label.

Engineering

The examiners noted one instance in which an operating procedure had not been accurately revised following a modification to remove a pressure indicator from the control room.

DETAILS

1.0 INTRODUCTION

The NRC administered initial examinations to three senior reactor operator (SRO) instant applicants. The examinations were administered in accordance with NUREG-1021, "Examiner Standards," Revision 7.

2.0 PREEXAMINATION ACTIVITIES

The facility performed a written examination review during the week of July 24, 1995. The simulator scenarios and job performance measures (JPMs) were validated by the NRC examiners using the facility's plant-referenced simulator and in the plant. The facility staff, who were involved with these reviews, signed security agreements to ensure the integrity of the initial examinations process.

3.0 EXAMINATION RESULTS AND CONCLUSIONS

3.1 Examination Results

The results of the examinations are summarized below:

	SRO Pass/Fail
Written	3/0
Operating	3/0
Overall	3/0

In a letter dated August 16, 1995, PECO Energy submitted comments (Attachment 2) and proposed resolutions on three questions in the written examination. The NRC resolution (Attachment 2) of these comments accepted the proposed resolutions. The grading of the applicants was based on the NRC resolutions of the facility comments.

Written

Due to the limited examination size, generic strengths and weaknesses of the applicants on the written examination was not noted.

Simulator Examination

The NRC examiners noted a weakness concerning the applicants' response to control room alarms. Specifically, the applicants did not verbally report, and supervisors did not acknowledge the operators' response to control room alarms in some important situations. All three applicants used a raised arm to silently indicate that an expected or routine alarm was being acknowledged. While this response mode could be helpful during times of multiple alarms, the examiners noted its use when few alarms existed and when meaningful information needed to be communicated within the crew. The applicants operated the simulator safely; however, the examiners judged that this weakness has the potential that adverse plant conditions may not be recognized in a timely manner, miscommunications may occur, and poor teamwork could result.

In subsequent discussions with the examiners, operations and training supervisors stated that a modified communications approach was being employed, but that the wisdom of the approach and its implementation would be reevaluated in light of how it had been applied in the simulator. The examiners noted that on shift control room operators also appeared to be applying similar responses to alarms during brief control room observations. PECO stated that the NRC examiners' observations may indicate that PECO's expectations concerning operators' response to control room alarms may not be entirely met. PECO also stated that appropriate corrective actions would be taken as deemed necessary.

3.2 Plant Procedures and Control Room Labeling

During the administration of the JPMs, the NRC examiners noted the following inconsistencies that were related to plant procedures that needed clarifications.

Procedure S06.1.C, "Placing A Standby Reactor Feed Pump In Service": Step 4.1.5 specifies that feed pump discharge pressure be controlled 50 to 70 psig greater than reactor pressure. This pressure was bit feasible because condensate pressure was 600 pounds and reactor pressure was 450 psig. Consequently, feed pump discharge pressure could only be reduced to condensate pump discharge pressure of 600 psig.

Procedure S41.3.A "Equalizing Pressure Across The MSIVs": Step 4.8 requires that steam pressure be monitored using instrument PR-01-103 at control room panel 10C653. The plant had been modified, and this pressure instrument was removed from the control room.

Step 4.1 references valve HV-01-109 "Main Steam To Condenser Hotwell Spargers." The control room identification of this valve was incorrectly labeled as HS-01-109.

PECO took prompt corrective actions to clarify the identified procedure inconsistencies and to correct the minor control room labeling of valve HV-01-109.

4.0 EXIT MEETING

An exit meeting was conducted on August 10, 1995, at the training center. The chief examiner identified the findings as described in the report. The PECO Energy representatives acknowledged the examiners' findings.

Attachments:
1. SRO Examination and Answer Key
2. PECO Energy Comments and NRC Resolution of Facility Comments
3. Simulation Facility Report

ATTACHMENT 1

SRO MASTER EXAMINATION AND ANSWER KEY

ATTACHMENT 1

SRO MASTER EXAMINATION AND ANSWER KEY

Nuclear Regulatory Commission
Operator Licensing
Examination

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

QUESTION: 001 (1.00)

The hold down mechanism on a jet pump has failed. This failure has allowed the rams head for a jet pump to become disengaged from the jet pump inlet. How will recirculation system performance change? Assume the plant was operating at 100% power before the failure occurred.

a. Core plate differential pressure will suddenly increase due to an increase in flow resistance in the affected loop.

b. Recirculation loop flow will decrease due to increased resistance to flow in the affected loop.

c. The jet pumps on the affected loop will lose drive flow and the displaced jet pump will start reverse flow.

d. A significant increase will occur in the indicated differential pressure on the jet pump that shares the same riser as the defective jet pump.

QUESTION: 002 (1.00)

Limerick unit one is operating at 50% power in single loop operation with the "B" recirculation loop out of service. When starting the "B" recirculation pump in preparation for placing the loop in service, the "B" recirculation loop discharge valve opens to 85% of the full open position and stops. How will the plant respond to this event?

a. The "B" recirculation pump drive motor breaker will trip.

b. The "A" recirculation pump will run back to 28% speed.

c. A rod block will occur.

d. A reactor scram will occur.

QUESTION: 003 (1.00)

Limerick unit one is operating at 70% power with the "A" recirculation pump secured. What actions should be taken if an electrical malfunction decreases the speed of the "B" recirculation pump until core flow is at 38% with reactor power at 60%?

a. Isolate the "A" recirculation loop to limit the reverse flow through the loop.

b. Insert control rods to exit the region.

c. Increase the speed of the "B" recirculation pump to exit the region.

d. Immediately scram the reactor to exit the region.

QUESTION: 004 (1.00)

Limerick unit one is operating at 70% power and is using spectral shift to increase core life when core flow is increased from 70MLB/hr to 80MLB/hr with no change in control rod pattern. Which one of the following statements describes the expected plant response five minutes after the flow increase was made?

a. The increase in flow shifts the power shape from higher in the core to lower in the core.

b. The increase in flow increases the overall void fraction in the core which decreases the production of Pu-239.

c. The increase in flow shifts the power shape from lower in the core to higher in the core.

d. The increase in flow decreases the overall void fraction in the core which increases the production of Pu-239.

QUESTION: 005 (1.00)

Limerick unit one is in cold shutdown with the "A" RHR system in shutdown cooling operation. The maintenance department wants to remove control power to RHR suction valves F008 and F009. Which of the following statements is correct concerning the work on valves F008 and F009 per Limerick station policy?

a. Control power can be removed from valves F008 and F009 if control room operators are informed of the degraded condition.

b. Control power cannot be removed from valves F008 and F009 at the same time.

c. Control power can be removed from valves F008 and F009 as long as control power is supplied to RHR suction valve F006A.

d. Control power cannot be removed from valves F008 and F009 unless a dedicated operator is stationed at those valves in constant communication with the control room.

QUESTION: 006 (1.00)

Limerick unit one is at 100% power and the "A" RHR pump is in suppression pool cooling. A loss of coolant accident occurs and plant pressure decreases to 475 pounds and remains at that pressure. Assuming no operator action, which of the following describes the response of the plant to the LOCA signal five minutes after event occurrence?

a. RHR pumps "A", "B" "C" and "D" are not injecting into the reactor vessel.

b. RHR pumps "A", "B", "C", and "D" are injecting into the reactor vessel.

c. The "A" RHR pump remains in suppression pool cooling, RHR pumps "B", "C", and "D" are injecting into the reactor vessel.

d. The "A" RHR pump remains in suppression pool cooling, RHR pumps "B", "C", and "D" are not injecting into the reactor vessel.

QUESTION: 007 (1.00)

Limerick unit one is in cold shutdown with the "A" RHR pump in the shutdown cooling mode of operation. Reactor water level decreases to the LPCI system initiation setpoint. What is the expected plant response assuming no operator action five minutes after the LPCI system initiation signal was generated ?

a. RHR pump loop suction and discharge valves, F008, F009, and F015A are closed. The "A", "B", "C" and "D" RHR pumps are injecting into the reactor vessel.

b. RHR pump loop suction and discharge valves F008, F009, and F015A are closed. The "A" RHR pump has tripped. The "B", "C" and "D" RHR pumps are injecting into the reactor vessel.

c. RHR pump loop suction and discharge valves F008, F009, and F015A remain open. The "A" RHR pump is in the shutdown cooling mode of operation. The "B", "C" and "D" RHR pumps are injecting into the reactor vessel.

d. RHR pump loop suction and discharge valves F008, F009, and F015A remain open. The "A" RHR pump is in the shutdown cooling mode of operation. The "B", "C" and "D" RHR pumps are not injecting into the reactor vessel.

QUESTION: 008 (1.00)

Limerick unit one is at 100% power. While conducting a stroke time surveillance test of the suppression pool spray isolation valve HV-F027A, the valve does not move when supplied with an open signal. All other reactor plant systems remain operable. Which of the following actions should be taken?

a. With one suppression pool spray loop inoperable, provided that at least one CSS subsystem is operable, restore the spray loop to operable status within 30 days or be in at least Hot Shutdown within the next 12 hours and in COLD shutdown within the next 24 hours.

b. With one CSS subsystem inoperable, provided that at least two LPCI subsystems are operable, restore the inoperable CSS subsystem to operable status within seven days or be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown within the following 24 hours.

c. With one suppression pool spray loop inoperable, restore the inoperable RHR loop to operable status within seven days or be in at least Hot Shutdown within the next 12 hours and Cold Shutdown within the following 24 hours.

d. With one or more of the primary containment isolation valves shown in table 3.6.3.1 inoperable, maintain at least one isolation valve Operable in each affected penetration that is open or be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown the following 24 hours.

QUESTION: 009 (1.00)

Limerick unit one is at 100% power when all suppression pool water level indication fails downscale. Subsequently, a valid RCIC initiation signal is generated due to a valid low reactor vessel water level of minus 38 inches. Prior to the event, RCIC was in a normal lineup and all supporting equipment was operable. What effect, if any, will the indication failure have on RCIC system operation?

a. The indication failure will not affect RCIC system operation.

b. The indication failure will prevent RCIC system automatic swapover to the suppression pool.

c. The indication failure will prevent startup of the RCIC system.

d. The indication failure will cause the RCIC system to take suction from the suppression pool immediately upon initiation.

QUESTION: 010 (1.00)

Limerick unit one is at 100% power. During a surveillance flow test of the RCIC turbine, the operator at the turbine reports excessive steam leaking at the packing of steam supply valve F045 and recommends closing the valve. The control room operator then depresses the turbine trip pushbutton. What is the response of the RCIC system?

a. The RCIC turbine stops but the leak is not isolated.

b. The RCIC turbine continues to operate.

c. The RCIC turbine stops and the leak is isolated.

d. The RCIC turbine continues to operate but the leak is isolated.

QUESTION: 011 (1.00)

The "A" RHR system is in suppression pool cooling when a high-high radiation alarm is received on the 1A heat exchanger outlet radiation monitor. Coincident with the radiation monitor alarm, the Division 3 power supply is de-energized due to an electrical fault. Which one of the following describes the plant response to the event?

a. The Hi-Hi radiation signal will cause closure of the associated RHR service water inlet and outlet valves (F014 and F068) RHRSW pumps OA and OC will trip.

b. The Hi-Hi radiation signal will cause closure of the associated RHR service water outlet valve (F068). RHRSW pumps OA and OB will trip.

c. The Hi-Hi radiation signal will cause closure of the associated RHRSW inlet and outlet valves (F014 and F068). RHRSW pumps will trip.

d. The Hi-Hi radiation signal will cause the closure of the associated RHR service water inlet valve (F014). RHRSW pump OA will trip.

QUESTION: 012 (1.00)

Limerick unit one is operating at 100% power when a LOCA occurs coincident with a loss of instrument air. Which one of the following describes how the HPCI room cooler would be affected five minutes after occurrence?

a. All cooling water to the HPCI room cooler is lost.

b. The ESW pumps have started and are supplying water to the HPCI room cooler.

c. The HPCI room cooler is not affected, as cooling is supplied by HPCI suction flow.

d. The service water system is supplying cooling water to the HPCI room cooler.

QUESTION: 013 (1.00)

Limerick unit one is in OPERATIONAL CONDITION 2. During a surveillance test, the inlet solenoid valve to the primary containment gaseous radioactivity monitoring system fails closed. All other plant systems are operable.

Which of the following describes the required plant actions?

a. Within four hours restore the inoperable valve to operable status or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. Within four hours restore the valve to operable status or be in at least HOT SHUTDOWN within the next 4 hours and in COLD SHUTDOWN within the following 12 hours.

c. No action is required in this OPERATIONAL CONDITION.

d. Operation may continue for up to 30 days provided grab samples of the containment atmosphere are obtained and analyzed a least once per 24 hours.

QUESTION: 014 (1.00)

A loss of offsite power has occurred at the Limerick Generating Station. Which of the following statements describes the status of the CO2 and Halon firefighting systems at Limerick?

a. Manual initiation of CO2 and Halon systems is available. Automatic initiation of CO2 is available. Automatic initiation of Halon is not available.

b. Manual initiation of CO2 and Halon systems is not available. Automatic initiation of CO2 and Halon is not available.

c. Manual initiation of CO2 and Halon systems is available. Automatic initiation of CO2 and Halon is not available.

d. Manual initiation of CO2 and Halon systems is available. Automatic initiation of CO2 and Halon is available in several areas.

QUESTION: 015 (1.00)

The control room has been evacuated due to a fire. The following conditions exist:

- Reactor is scrammed, Remote Shutdown Panel is occupied.
- MSIVs are closed.
- Condensate pumps tripped.
- RCIC and HPCI have been initiated.
- RPV water level is 40 inches and rising rapidly.

With all Remote Shutdown Transfer switches in EMERGENCY, which of the following describes the response of HPCI and RCIC when RPV water level reaches +54 inches?

a. HPCI and RCIC will stop injecting at +54 inches.

b. RCIC will stop injecting at +54 inches, HPCI will continue to inject.

c. HPCI and RCIC will continue to inject beyond +54 inches.

d. HPCI will stop injecting at +54 inches, RCIC will continue to inject.

QUESTION: 016 (1.00)

What change, (if any) will occur to fuel pool and skimmer surge tank level one minute after electrical power to the fuel pool pumps is lost?

a. No change, fuel pool and skimmer tank levels are unaffected by a loss of the pumps.

b. Fuel pool level will decrease to the top of the weirs. Skimmer surge tank level will increase.

c. Fuel pool level will remain constant. Skimmer surge tank level will decrease.

d. Fuel pool level will decrease to the top of the weirs. Skimmer surge tank level will remain constant.

QUESTION: 017 (1.00)

Refueling is in progress at Limerick unit one. The fuel bridge operator has commenced withdrawing a fuel bundle from the core. Which one of the following statements describes the indications that the refuel bridge operator would expect to see on the bridge as the fuel is being withdrawn from the core?

a. Hoist loaded indicator illuminated, slack cable indicator extinguished, load cell indicates 470 pounds.

b. Hoist loaded indicator illuminated, slack cable indicator extinguished, load cell indicates 630 pounds.

c. Hoist loaded indicator not illuminated, grapple normal up indicator illuminated, load cell indicates 470 pounds.

d. Hoist Loaded indicator illuminated, grapple normal up indicator illuminated, slack cable indicator extinguished, load cell indicates 630 pounds.

QUESTION: 018 (1.00)

The control room HVAC system is lined up in the radiation isolation mode, when a high chlorine condition occurs at the control room HVAC outside air intake plenum. All chlorine detectors measure high chlorine, except for the "B" detector which is indicating low. Which of the following statements describes how the plant will respond to this event?

a. The control room inlet and outlet ventilation dampers will isolate. The inlet dampers to the CREFAS filters will open, the CREFAS fans will start, and dampers PDC78-014A/B will modulate to maintain positive pressure in the control room.

b. The control room inlet and outlet ventilation dampers will isolate. The inlet dampers to the "A" CREFAS filter will open, the "A" CREFAS fan will start, and damper PDC78-014A will modulate to maintain positive pressure in the control room.

c. The CREFAS fans will trip and restart 30 seconds after receipt of the signal. The inlet dampers to the "A" CREFAS filter will isolate.

d. The CREFAS fans will trip and restart 30 seconds after receipt of the signal. The inlet dampers to the "B" CREFAS filter will isolate.

QUESTION: 019 (1.00)

Limerick unit one is operating at 100% power when 120 VAC power is lost to the "A" reactor feed pump motor gear unit. Subsequently, the "A" feed pump receives a runback signal. How will the "A" reactor feed pump respond to these events?

a. The speed of the "A" reactor feed pump will decrease to the Low Speed Stop.

b. The speed of the "A" reactor feed pump will decrease to the 42 percent Low Speed Stop and then "lock" at this speed.

c. The speed of the "A" reactor feed pump will remain at the speed that was present before control power was lost.

d. The speed of the "A" reactor feed pump will increase until the High Speed Stop Limiter is reached, then decrease to the Low Speed Stop.

QUESTION: 020 (1.00)

Limerick unit one is operating at 100% power when the "C" feed flow transmitter fails low. How will the plant respond to this event?

a. Feed pump speed is increased until indicated feed flow approaches indicated steam flow. 2. Reactor level begins to increase. 3. The increase in level causes turbine speed to decrease. 4. Level stabilizes at a higher level.

b. Feed pump speed is decreased until indicated feed flow approaches indicated steam flow. 2. Reactor level begins to decrease. 3. The decrease in level causes turbine speed to increase. 4. Level stabilizes at a lower level.

c. All feed pumps will accelerate to high speed setting. 2. Recirculation pumps runback to 28% speed. 3. Setpoint setdown is activated. 4. Reactor level will increase until the reactor feed pumps and main turbine trip.

d. Reactor feed pumps will decelerate to low speed setting. 2. Reactor level begins to decrease. 3. Recirculation pumps runback to 28% speed. 3. Reactor power will decrease due to recirculation pump runback. 4. Reactor level will decrease, followed by a return to normal level.

QUESTION: 021 (1.00)

Limerick unit one is at 17% power. The operator is in the process of synchronizing the turbine to the grid and is ready to close the generator output breaker. A malfunction occurs in the turbine control system and turbine speed increases to just below the turbine trip setpoint. Which of the following statements describes how the plant will respond to this event?

a. The synchroscope will turn clockwise slower, generator voltage will increase.

b. The synchroscope will turn clockwise faster, generator voltage will not change.

c. The synchroscope will turn counterclockwise faster, generator voltage will decrease.

d. The synchroscope will turn counterclockwise faster, generator voltage will not change.

QUESTION: 022 (1.00)

A LOCA has occurred at Limerick unit one. Offsite power is available. Prior to the event, the unit was in cold shutdown and "C" and "D" RHR pumps were in service. Which of the following statements describes the equipment that receive a start signal from the LOCA initiation relays in addition to the Core Spray and ESW pumps and the control room chillers?

a. CRD pumps start.

b. "C&D" RHR pumps start.

c. "A&B" RHR pumps start.

d. "A&B" RHR pumps start.
"C&D" RHR pumps start.

QUESTION: 023 (1.00)

The D-12 diesel generator was running due to a LOCA initiation signal on Limerick unit 1, when a rupture of the Emergency Service Water piping caused a complete loss of cooling to the D-12 diesel. Identify the response of the D-12 diesel generator.

a. The diesel will trip on low lube oil pressure.

b. The diesel will trip on high lube oil temperature.

c. The diesel will not trip.

d. The diesel will trip on high coolant temperature.

QUESTION: 024 (1.00)

The D-11 emergency diesel generator is operating at 1500KW for the monthly surveillance test, when a failure of the air cooler temperature control valve causes the diesel generator intake combustion air temperature to decrease. Which of the following statements describes the response of the diesel generator to this failure?

a. The diesel generator will assume more electrical load.

b. The diesel generator will assume less electrical load.

c. The diesel generator will continue to operate at 1500Kw.

d. The diesel generator will trip.

QUESTION: 025 (1.00)

Offsite power has been lost to both units due to severe weather conditions, and all eight diesel received a start signal. The D-12 diesel has started but the fuel oil transfer pump for the D-12 diesel is inoperable due to ongoing mechanical work. If the diesel is to be operated at rated load (2850KW) how long will it operate? Assume all fuel oil tanks are at the technical specification minimum value prior to the diesel start.

a. Approximately seven days.

b. Approximately four hours.

c. Approximately one day.

d. Approximately five minutes.

QUESTION: 026 (1.00)

Given the following plant/conditions, determine which statement is correct concerning system/equipment operability.

- Limerick one and two are at 100 percent power.
- The "OA" ESW pump is out of service.
- The "OC" ESW pump coupling has been found to be sheared.

a. ESW can be aligned such that six (6) diesel generators remain operable.

b. Only four (4) diesels remain operable.

c. All equipment normally supplied by the ESW loop can be lined up to the "B" ESW loop and remain operable.

d. "A" ESW loop loads should be supplied by the "B" ESW loop as long as both "B" and"D" ESW pumps remain operable.

QUESTION: 027 (1.00)

Limerick unit one is at 100% power when the Division 3 DC bus is lost. Which one of the following statements describes how this event will affect plant operations?

a. RCIC will not start on an initiation signal due to loss of power to logic and valves.

b. HPCI will not start on an initiation signal due to a loss of power to logic and valves.

c. RCIC will start on an initiation signal but power is lost to RCIC valve isolation logic.

d. HPCI will start on an initiation signal but power is lost to HPCI valve isolation logic.

QUESTION: 028 (1.00)

Limerick unit one is connected to the grid at 45% power when a stator cooling water runback signal is generated. Which one of the following describes the initial response of the plant of the plant to this event?

a. One recirculation pump trips, the turbine control valves close, and the bypass valves open. Reactor power does not change.

b. One recirculation pump trips, the turbine control valves close, and the bypass valves open until reactor power decreases until the no cooling setpoint is reached.

c. The turbine control valves close, the bypass valves open until reactor power decreases to the no cooling setpoint. No recirculation pumps trip.

d. The turbine control valves close, and the bypass valves open. Reactor power increases. No recirculation pumps trip.

QUESTION: 029 (1.00)

While operating at 100% power, the output of both EHC pressure regulators fails high, causing turbine bypass valves to open.

Which of the following EHC controls may be used to close the bypass valve?

a. bypass jack

b. load set

c. pressure set

d. maximum combined flow limiter

QUESTION: 030 (1.00)

The reactor is operating at 100% power with the Electro-Hydraulic Control (EHC) load set at 105%, the maximum combined flow set at 115%, and the load limit set to 105%. Which ONE of the following indicates the new position of the control and bypass valves if the load limit potentiometer is reduced to 96%?

a. Control valve position --> 96% steam flow
   Bypass valve position --> 4% steam flow

b. Control valve position --> 100% steam flow
   Bypass valve position --> 14% steam flow

c. Control valve position --> 86% steam flow
   Bypass valve position --> 14% steam flow

d. Control valve position --> 100% steam flow
   Bypass valve position --> 10% steam flow

QUESTION: 031 (1.00)

Limerick unit one is operating at 100% power. The oil level in the seal oil vacuum tank has increased above the level of the spray nozzles in the seal oil vacuum tank. How does this event affect operation of the seal oil system?

a. Main seal oil suction pressure will decrease.

b. The moisture content in the seal oil will increase.

c. Hydrogen seal oil pressure will increase.

d. Main turbine lube oil hydrogen content will decrease.

QUESTION: 032 (1.00)

Limerick unit 1 is operating at 85% power and experiences a problem with the main generator stator water cooling system. Conditions are as follows:

"A" Stator Water Cooling Pump	- Tripped in pull-to-lock
"B" Stator Water Cooling Pump	- Running
Stator Cooling Water outlet temperature	- 76 degrees C
Stator Cooling Water inlet pressure	- 11 psig
Stator Cooling Water storage tank level	- 4" below normal level and decreasing

Select the response of the main turbine from the choices below.

a. The main generator stator amps must be reduced below 7469 amps in 3.5 minutes or the main turbine will trip.

b. The main turbine will automatically trip two minutes after the stator cooling water inlet pressure drops below 11 psig.

c. The main turbine will trip two minutes after stator cooling outlet temperature reaches 81 degrees C.

d. The main turbine will automatically trip after the "B" stator water cooling pump trips with a 3.5 minute time delay.

QUESTION: 033 (1.00)

Limerick unit one is at 100% power when the reference APRM signal to a Rod Block Monitor channel fails upscale. Prior to the event no Rod Block or half-scram signals were present. How does the associated Rod Block Monitor respond to this event?

a. The associated Rod Block Monitor channel switches to the backup APRM.

b. A half-scram signal is generated.

c. The rod worth minimizer is energized and enforces withdraw of rods in a predetermined sequence.

d. The associated Rod Block Monitor channel remains at the high trip setpoint.

QUESTION: 034 (1.00)

With the mode switch in STARTUP and IRM "C" reading 11 on Range 7, the operator inadvertently ranges IRM "C" down to Range 6? What trip(s) or alarm(s) would occur?

a. Reactor scram and Upscale High-High alarm.

b. Rod block and Upscale High alarm.

c. IRM inop

d. Rod Block only

QUESTION: 035 (1.00)

Limerick unit two is at 100% power. When selecting a control rod, the operator notes one of the four LPRMS is reading low. Which one of the following recommendations should be made to check the performance of the LPRM?

a. Perform a calormetric (OD-1) and adjust LPRMS as required.

b. Perform a tip trace (OD-2) and adjust LPRMS as required.

c. Perform an APRM loop calibration and adjust the LPRMS as required.

d. Run a "Fit Adaptive" OD-4 case program and adjust the LPRMS as required.

QUESTION: 036 (1.00)

While operating at 100% power, leakage develops past the scram outlet valve seat of partially withdrawn rod 30-31.

Which of the following will occur as a result of this condition?

a. Rod 30-31 will begin to drift in.

b. The blue scram light will come on for rod 30-31.

c. Rod 30-31 will begin to drift out.

d. CRD ACCUMULATOR LO PRESS HI LEVEL alarm will be received.

QUESTION: 037 (1.00)

An ATWS has occurred, at Limerick unit one due to scram discharge valve blockage and reactor pressure has reached 1125 pounds per square inch. Identify the expected condition of the alternate rod insertion, scram pilot, and backup scram insertion valves.

a. The alternate rod insertion valves, the scram pilot valves and the backup scram solenoid valves are de-energized.

b. The alternate rod insertion valves and the scram solenoid valves are de-energized; the backup solenoid scram pilot valves are energized.

c. The alternate rod insertion valves and backup scram solenoid valves are energized; the scram pilot valves are de-energized.

d. The alternate rod insertion valves are energized; the scram pilot valves and the backup scram solenoid valves are de-energized.

QUESTION: 038 (1.00)

Following the resetting of a scram, the Scram Discharge Volume High Water Level Scram Bypass Switch is inadvertently left in the BYPASS position. How will this event affect the plant when the Reactor Mode Switch is taken from SHUTDOWN to the REFUEL position?

a. All control rod blocks will be bypassed.

b. A full scram will occur.

c. The scram discharge volume high water level scram will be reenabled.

d. The scram discharge volume high water level scram will remain bypassed.

QUESTION: 039 (1.00)

Limerick unit one is operating at 100% power with a half scram inserted on the "B" reactor protection system. Suddenly, an electrical failure occurs which deenergizes one of the four lights and rod groups on the "A" reactor protection system. Which one of the following statements describes how the plant will respond to this event.

a. No affect on the control rods or scram discharge volume vent and drain valves.

b. A full scram will occur. The scram discharge volume inlet and outlet valves will close.

c. One half of the control rods will scram. The scram discharge volume inlet and outlet valves will remain open.

d. One quarter of the control rods will scram. The scram discharge volume inlet and outlet valves will remain open.

QUESTION: 040 (1.00)

WHICH ONE (1) of the following sets of conditions for the Standby Liquid Control System meets the requirements of Tech Specs for operability?

a. Sodium pentaborate (% by weight) - 12%
Tank volume - 3000 gallons
Solution temperature - 60F

b. Sodium pentaborate (% by weight) - 14%
Tank volume - 3200 gallons
Solution temperature - 75F

c. Sodium pentaborate (% by weight) - 11%
Tank volume - 4000 gallons
Solution temperature - 60F

d. Sodium pentaborate (% by weight) - 14%
Tank volume - 3500 gallons
Solution temperature - 80F

QUESTION: 041 (1.00)

Limerick unit one is operating at 100% power when the Division 1 redundant reactivity control system (RRCS) is deenergized. Subsequently, reactor pressure increases to 1095 psi and a RRCS initiation signal is generated. Which one of the following describes the plant response to the event?

a. The reactor scrams, both recirculation pumps trip, the feedwater system is runback, all three standby liquid control system pumps start, the reactor water cleanup system isolates.

b. The reactor scrams, the "B" recirculation pump trips, the feedwater system is runback, the "B" and "C" standby liquid control system pumps start, the reactor water cleanup system isolates.

c. The reactor scrams, both recirculation pumps trip.

d. One half of the control rods scram. The "B" recirculation pump trips, the feedwater system is runback, the "B" and "C" standby liquid control system pumps start, the reactor water cleanup system isolates.

QUESTION: 042 (1.00)

Both reactors have scrammed from 100% power due to a loss of offsite power. The following conditions exist at Unit 1:

- All EDGs have started
- Reactor pressure is cycling with relief valve actuation
- The Division three power supply to the ADS valves is inoperable
- Reactor water level is -129 inches and decreasing at 1 inch/minute
- RCIC is injecting at rated flow
- HPCI initiated then tripped
- Drywell pressure is 2.0 psig and slowly increasing
- RHR pumps "A" and "C" are operating with a discharge pressure of 125 psig

SELECT the response of the Unit 1 Automatic Depressurization System (ADS), if no operator action is taken.

a. ADS will automatically initiate in 105 seconds

b. ADS will automatically initiate in 420 seconds

c. ADS will automatically initiate in 525 seconds

d. ADS will NOT automatically initiate

QUESTION: 043 (1.00)

The plant was operating at 50% reactor power when an inadvertent HPCI initiation occured when an I&C technician inadvertently simulated a -38 reactor vessel low water level signal to the HPCI control logic. The HPCI system injected into the reactor vessel until it was terminated by an operator who isolated the HPCI system by depressing the manual isolation pushbutton. Subsequently, a valid low reactor water level initiation signal occurred due to a loss of feedwater event. How did the HPCI turbine respond to this event?

a. The HPCI turbine does not operate.

b. The HPCI turbine starts but suffers severe bearing damage due to a lack of oil pressure from the "Aux Oil Pump" which did not start.

c. The HPCI turbine starts and injects water into the reactor vessel.

d. The HPCI turbine starts but trips on overspeed due to a lack of oil to the governor mechanism.

QUESTION: 044 (1.00)

Limerick unit one is in the process of shutting down for a refueling outage. Plant conditions are as follows:

- Reactor power IRM Range 4
- Reactor level +35" on startup level control
- Reactor pressure 400# maintaining cooldown with the bypass valves

With all the Core Spray systems in their normal lineup, a spurious Division 3 LOCA signal occurs. What is the expected response of the Core Spray system?

a. "A" and "C" Core Spray pumps running, Outboard Injection Valve (F-005) closed, Discharge Injection (F-004A) open.

b. "A" Core Spray pump running, Outboard Injection Valve (F-005) open, Discharge Injection (F-004A) open.

c. "C" Core Spray pump running, Outboard Injection Valve (F-005) closed, Discharge Injection Valve (F-004A) open.

d. "C" Core Spray pump running, Outboard Injection Valve (F-005) open, Discharge Injection Valve (F-004A) open.

QUESTION: 045 (1.00)

Limerick unit one is operating at 100% power when level transmitter LT-115A is declared inoperable. Using the attached schematic, which one of the following statements describes how this event will affect plant operation?

a. The transmitter does not directly affect safety-related equipment.

b. ADS is inoperable. ADS would not operate if an initiation signal was generated.

c. The low and high reactor water level isolations are inoperable.

d. ADS is inoperable. However, ADS would still operate if an initiation signal was generated.

QUESTION: 046 (1.00)

Startup is in progress on Limerick unit one with reactor power at 11% and reactor pressure at 950 psi. While withdrawing control rod 34-23 the low accumulator pressure alarm for that rod energizes. Which one of the following is the required action?

a. Restore the accumulator to operable status or declare the control rod inoperable.

b. Full insert and electrically disarm control rod 34-23.

c. Restart a control rod drive pump within 20 minutes.

d. Immediately scram the reactor.

QUESTION: 047 (1.00)

Limerick unit one is operating at 100% power when a malfunction in the control rod drive hydraulic system decreases exhaust water header pressure. Which one of the following describes how the pressure decrease will affect operation of the control rod drive system?

a. The pressure control valve will open.

b. Control rod withdrawal speed may increase.

c. Accumulator pressure will increase.

d. Cooling water flow will increase.

QUESTION: 048 (1.00)

An equipment operator informs you that a containment downcomer vacuum breaker will not remain closed when it is cycled during a surveillance test. How could this event affect the containment response to a design basis LOCA during the blowdown phase of the accident?

a. The open vacuum breaker would increase the amount of noncondensables gases that would coalesce in the suppression pool during the blowdown phase of an accident.

b. The open vacuum breaker could cause inward collapse of the suppression pool due to low internal pressure by allowing steam to discharge quicker into the pool and hence condense faster.

c. The open vacuum breaker could cause containment failure by reducing the pressure suppression capability of the suppression pool.

d. The open vacuum breaker could increase upward force on the drywell floor during the blowdown phase of an accident.

QUESTION: 049 (1.00)

Limerick 1 is operating at 100% power when an inadvertent inboard isolation occurs on drywell chilled water valves (HV87-122, 123, 128, 129). The PRO bypasses the isolation by placing HS87-115 in the "BYPASS" position and opens the valves. Subsequently, a LOCA occurs. Which one of the following statements is correct?

a. The inboard isolation valves will isolate then reopen when power is restored. The outboard valves will isolate.

b. The inboard isolation valves will remain open and the outboard isolation valves will isolate.

c. The inboard and outboard chilled water valves will isolate and remain closed.

d. The inboard and outboard chilled water valves will remain open.

QUESTION: 050 (1.00)

Limerick unit one is operating at 100% power when a large break in the RWCU system occurs that opens the steam blowout panel. The reactor scrams and reactor water level reaches -39 inches before recovering to the normal operating band. Which one of the following describes the plant response to this event?

a. A NS4 isolation occurs, and the RERS and SBGT systems start. Steam is not released directly into the enviroment.

b. A NS4 isolation does not occur, however the RERS and SBGT systems start. Steam is not released into the enviroment.

c. A NS4 isolation occurs, the RERS and SBGT systems do not start. Steam from the break is released directly into the environment.

d. A NS4 isolation occurs, and the RERS and SBGT systems start. However, steam from the break is released directly into the environment.

QUESTION: 051 (1.00)

All of the following will occur as a result of a full refuel floor isolation EXCEPT.

a. Both SBGT fans start (both in auto) and begin drawdown.

b. Both SBGT parallel connecting dampers to Unit 1 Refuel floor HVAC supply line open.

c. Normal supply and exhaust fans trip.

d. The AUTO RERS fan starts.

QUESTION: 052 (1.00)

During operation at 100% power, at Limerick unit one, an Equipment Operator who has been directed to perform a periodic check of the RHR system discovers a manual valve out of its normal position.

Which of the following describes the action to be taken in accordance with OM-C-11.1. "Independent Verification"?

a. Immediately reposition the valve and notify security.

b. Notify shift management and obtain permission prior to repositioning the valve.

c. Notify the Unit Reactor Operator and reposition the valve.

d. Reposition the valve and record it on the log sheet for turnover.

QUESTION: 053 (1.00)

Limerick unit two is operating at 100% power. You are requested to provide temporary relief to the on-shift Unit Reactor Operator (URO) who has been called to the Shift Managers' Office to meet with the NRC Resident Inspector. The URO is expected to be gone for less than 40 minutes. You are a member of the duty shift, have participated in the turnover process and attended the shift turnover meeting. What requirements, if any, should be met before relieving the URO in accordance with OM-C-6.2?

a. A briefing on unit conditions and ongoing evolutions is required before assuming the URO position. The temporary relief is not required to be documented in the R/O narrative log.

b. A briefing on unit conditions and ongoing evolutions is required before assuming the URO position. The temporary relief is required to be documented in the R/O narrative log.

c. No briefing on unit conditions and ongoing evolutions is required before assuming the URO position due to the short nature of the absence. Documentation of the turnover is not required in the narrative log.

d. No briefing on unit conditions and ongoing evolutions is required before assuming the URO position since the absence is necessary to meet a request from an NRC inspector. Documentation of the turnover is required in the narrative log.

QUESTION: 054 (1.00)

The health physics department has just completed a survey of a local area. General area radiation levels are 110 mrem/hour. The airborne radiation levels is equivalent to .2 DAC hours. What should be the required posting for the area?.

a. Airborne radiation area, high radiation area

b. High radiation area

c. Airborne radiation area, radiation area

d. Radiation area

QUESTION: 055 (1.00)

Limerick unit two is operating at 100% power when the Reactor Water Cleanup System Nonregenerative heat exchanger develops a 10 GPM leak due to a tube failure. Which of the following is the expected response of the reactor water chemistry?

a. Reactor water turbidity starts increasing.

b. Reactor water vessel chemistry is unaffected.

c. The conductivity of reactor water returning from the heat exchanger starts increasing.

d. Reactor water PH starts decreasing.

QUESTION: 056 (1.00)

Limerick unit one is operating at 100% power when a small electrical fire in the RCIC enclosure disables the RCIC control governor system. The electrical fire was extinguished in one minute by a maintenance worker. Using the provided copy of ERP-101 select the appropriate emergency classification (if required).

a. No emergency classification is required

b. Alert

c. Unusual event

d. Site area emergency

QUESTION: 057 (1.00)

Using the provided Limerick unit two daily core performance printout for reference, select the appropriate statement that accurately interprets the data.

a. A safety limit has been violated since MFLCPR has decreased to less than one in core regions 1-9.

b. Core location 29-10 is producing ~~more~~ LESS node power than core location 33-12.

c. Several APRMs are indicating a higher percent power than core thermal power.

d. A thermal limit is currently being exceeded.

QUESTION: 058 (1.00)

In accordance with Limerick Administrative Procedure A-41.1, "Troubleshooting, Plant Equipment" identify the individual required to authorize troubleshooting and related activities prior to the commencement of troubleshooting?

a. Plant Manager.

b. Superintendent - Technical.

c. Shift Supervision.

d. Shift Operations Assistant.

QUESTION: 059 (1.00)

SELECT the ONE condition that describes when a CONTINUOUS FIREWATCH would be required by Technical Specifications.

a. The Diesel Driven Fire Pump is inoperable.

b. The CO2 storage tank pressure was checked 10 days ago.

c. The Halon storage tank is 90% of full charged pressure.

d. The spray and sprinkler system valve line-up was performed 10 days ago.

QUESTION: 060 (1.00)

You are entering a high radiation area to perform a valve lineup. The general area radiation level is 200 millirem per hour. ASSUME:

1. You have received 200 millirem total effective dose equivalent for the current week.
2. Prior to this week you had 1600 millirem exposure total effective dose equivalent for the current year.
3. No special approvals have been given.
4. You are a qualified male radiation worker at the Limerick facility.
5. NRC-4 form is complete and on file.

SELECT your MAXIMUM ALLOWABLE STAY TIME in this area without exceeding any administrative or NRC limits.

a. 8.5 hr.

b. 6 hr.

c. 7 hr.

d. 16 hr.

QUESTION: 061 (1.00)

Which ONE of the following must be completed by a licensed operator to maintain his/her license in an "active status" per the regulations of 10 CFR 55.53 (e), "Conditions Of Licenses"?

The operator shall actively perform the functions of the appropriately licensed operator on a minimum of:

a. Seven 8 hour shifts or five 12 hour shifts per calendar month.

b. Seven 8 hour shifts or five 12 hour shifts per calendar quarter.

c. Five 8 hour shifts or three 12 hour shifts per calendar month.

d. Five 8 hour shifts or three 12 hour shifts per calendar quarter.

QUESTION: 062 (1.00)

While taking this exam at the Limerick training center, a site area emergency is declared by shift management, what are your actions?

a. Report to control room.

b. Report to Operational Support Center.

c. Report to Technical Support center.

d. Report to assembly area and wait there for instructions.

QUESTION: 063 (1.00)

The 1A diesel generator transfer pump did not start when the operator turned the pump control switch to the start position. Using the attached schematic for reference, identify a possible cause for the pump failure to start.

a. The "42" relay did not deenergize when pump control switch HS20-121A was placed in the start position.

b. An open exists between the red indicating light and terminal point "7" of contact "42/a".

c. A high fuel oil level exists in the day tank.

d. An open exists between the "42" relay and the "B2" contact of control switch HS20-121A.

QUESTION: 064 (1.00)

Which of the following combinations of instruments are all available following a loss of all AC power (station blackout)?

a. LI-42-*R606C ("C" Narrow Range)
LI-42-*R604 (Wide Range *0C603)
LI-42-*R610 (Fuel Zone Meter *0C601)

b. PI-55-*R602 (HPCI Turbine Steam Pressure)
PI-55-*R601 (HPCI Pump Discharge Pressure)
~~P~~I-55-*R601 (HPCI Room Cooler Flow)
FI

c. LI-42-*R606C ("C" Narrow Range)
LI-42-*R604 (Wide Range *0C603)
LI-42-*R605 (Shutdown Range, *0C602)

d. TI-55-*R603 (HPCI Room Temperature)
PI-55-*R601 (HPCI Pump Discharge Pressure)
FI-55-*R601 (HPCI Room Cooler Flow)

QUESTION: 065 (1.00)

During a complete core offload, the last fuel bundle falls off the refueling grapple and into the reactor vessel. The bundle is dropped in a manner such that it falls in a horizontal orientation. Which of the following components in the reactor vessel could be damaged by such a drop?

a. Steam separator assembly.

b. Top guide grid.

c. Fuel support piece.

d. Jet pump diffuser section.

QUESTION: 066 (1.00)

ON-119, "Loss of Instrument Air", requires a rapid power reduction to less than 45% if both instrument air compressor discharge pressures drop below 85 psig. State the reason for this power reduction.

a. To limit the pressure and reactivity transient from the closure of the MSIVs on a complete loss of air.

b. To ensure adequate feed flow to the reactor should the condensate or feed pump minimum flow valves drift open.

c. To prevent violation of fuel thermal limits caused by unanalyzed control rod patterns as the rods start to drift into the core.

d. In anticipation of the loss of condenser vacuum because the steam jet air ejectors will be effected by the loss of air.

QUESTION: 067 (1.00)

The plant is at 100% power, F002, the inboard HPCI steam isolation valve and F003, the outboard steam isolation valve, are closed for a surveillance test. A LOCA occurs coincident with a loss of all AC power and reactor vessel water level decreases to -38 inches. Which of the following statements describes the response of HPCI to the event if no operator action is taken?

a. HPCI will start and inject into the reactor vessel as designed.

b. HPCI will not start.

c. HPCI will start and inject into the reactor vessel. Manual control of the HPCI system will be needed when the reactor vessel high level trip setpoint is reached.

d. HPCI will start and remain on the minimum flow line until manual control of the flow control valve is taken to establish flow to the reactor vessel.

QUESTION: 068 (1.00)

Upon entry into ON-107, "Control Rod Drive System Problems", you observe that ALL of the following conditions exist:

1. More than half of the control rods are withdrawn
2. CRD pump suction low pressure alarm has illuminated.
3. Reactor pressure is 550 psig.
4. Two (2) CRD accumulator trouble lights are illuminated.
5. CRD charging water header pressure is zero (0) psig.

As the reactor operator, which ONE of the following operator actions are you required to take per ON-107?

a. Bypass and isolate pump suction filter.

b. Place alternate CRD pump in service.

c. Close FCV to increase charging water header pressure.

d. Place the Mode switch in SHUTDOWN.

QUESTION: 069 (1.00)

Limerick unit one is operating at 100% power. While reviewing control room logs you note that containment pressure has decreased over the previous two shifts. Pressure is now .1 psig. Which one of the following statements contains three changes all of which will reduce containment pressure?

a. Decrease in suppression pool level, decrease in barometric pressure, decrease in chilled water temperature.

b. Decrease in suppression pool level, decrease in barometric pressure, increase in chilled water temperature.

c. Decrease in suppression pool level, increase in barometric pressure, decrease in chilled water temperature.

d. Increase in suppression pool level, increase in barometric pressure, decrease in chilled water temperature.

QUESTION: 070 (1.00)

Limerick unit one is operating at 45% power when a stator cooling water turbine runback occurs. What affect, if any, will this event have on plant operations?

a. Feedwater temperature will increase.

b. Core inlet subcooling will increase.

c. Reactor power will decrease.

d. Recirculation pump NPSH will decrease.

QUESTION: 071 (1.00)

When can normal RPV cooldown rates can be exceeded?

a. The inability to keep suppression pool temperature below the heat capacity temperature limit.

b. RPV pressure is on the UNSAFE side of the RPV PRESSURIZATION limit curve of T-99 "Post Scram Restoration".

c. A LOCA inside the Drywell causing pressure to rapidly increase to 10 psig.

d. SRVs are being used to depressurize the RPV with normal and long term pneumatics unavailable.

QUESTION: 072 (1.00)

Unit 1 has just scrammed. The following plant conditions exist:

- Reactor Power	3%
- Reactor Water Level	13.5 inches
- Reactor Pressure	1057 psig
- Drywell Pressure	2.0 psig
- Suppression Pool Temp	90 Degrees F

- Reactor Enclosure Hi-Hi Floor Drain Sump Alarm Condition

Which one (1) of the following sets of procedures must be entered?

T-101- "RPV Control"
T-102- "Primary Containment Control"
T-103- "Secondary Containment Control"

a. T-101 and T-102

b. T-101 and T-103

c. T-102 and T-103

d. T-101, T-102, and T-103

QUESTION: 073 (1.00)

The Shift Manager has just ordered a control room evacuation. Which of the following is NOT an immediate operator action?

a. Trip the recirculation pumps.

b. Trip the main turbines.

c. Manually scram both reactors.

d. Close MSIVs.

QUESTION: 074 (1.00)

Limerick unit two is starting up and is at 65% power. The drywell is being inerted. Drywell pressure has increased to 1.5 psig and is holding at that pressure. There is leakage of 1 gpm in the drywell that is routed to the Equipment Drain Sump. The PRO reports to the shift supervisor that Drywell Unit Cooler condensate flowrate is 3 gpm. Which of the following statements describes the action that should be taken. ASSUME all other plant parameters are in their normal range.

a. Restore Drywell pressure to within limits within 1 hour or be in hot shutdown within the next 12 hours.

b. Reduce the Reactor Coolant System leakrate within limits within 4 hours or be in at least hot shutdown within the next 12 hours.

c. Be in at least hot shutdown within the next 12 hours and in cold shutdown within the next 24 hours.

d. No action is required per Limerick Unit 2 plant technical specifications.

QUESTION: 075 (1.00)

Due to a small steam line break which can not be isolated, the following conditions exist:

HPCI Area Rad	150mr/hr
RE Exhaust Duct Rad	1.55mr/hr
HPCI Room	Greater Than Max Safe Op Temp
RCIC Room	Less Than Max Safe Op Temp
RPV Water Level	35 Inches

Based upon the above plant conditions which of the following describes the required actions?

a. Scram and perform an emergency RPV blowdown. Ensure the reactor enclosure remains isolated.

b. Scram and perform an emergency RPV blowdown. Restore RE HVAC.

c. Scram and perform a normal cooldown. Restore RE HVAC.

d. Scram and perform a normal cooldown. Ensure the reactor enclosure remains isolated.

QUESTION: 076 (1.00)

A reactor scram has occurred. Several control rods failed to fully insert resulting in the reactor remaining slightly subcritical. No SLC has been injected. During the cooldown, rising SRM count rate indicative of criticality occurs. Which of the following describes the required actions?

a. Inject SLC while continuing the cooldown.

b. Stabilize pressure, until additional control rods can be inserted to shutdown the reactor.

c. Add negative reactivity by slowly depressurizing the plant using the SRVs. When the reactor becomes subcritical again, resume the cooldown.

d. Stabilize pressure and stop the cooldown. Inject SLC until hot Shutdown Boron Weight is injected.

QUESTION: 077 (1.00)

A fuel floor radiation monitor has alarmed while an irradiated fuel bundle was being lowered into the spent fuel pool storage rack at Limerick unit one. No objects were being handled near the fuel pool water surface prior to receipt of the alarm. Per ON-120, "Fuel Handling Problems" which of the following describes the expected operator actions?

a. If possible, return the fuel bundle back to the original core location; evacuate the refuel floor; place the refueling floor ventilation to the SBGT system. Notify the Shift Manager, Health Physics and Reactor Engineering. Obtain permission from the Operations Senior Manager before resuming refueling activities.

b. Immediately evacuate the refuel floor; place the refueling floor ventilation to the SBGT system; increase demineralizer fuel pool cooling flow. Notify the Shift Manager, Health Physics and Reactor Engineering.

c. If possible continue to lower the fuel bundle into the fuel storage rack; evacuate the refuel floor; place the refueling floor ventilation to the SBGT system. Notify the Shift Manager, Health Physics and Reactor Engineering. Obtain permission from the Operations Senior Manager before resuming refueling activities.

d. Immediately evacuate the refuel floor; notify the Sh'ft Manager, Health Physics and Reactor Engineering. Obtain permission from the Operations Senior Manager before resuming refueling activities.

QUESTION: 078 (1.00)

A scram signal has occurred at Limerick one, and the following plant conditions exist two minutes after the scram signal.

Reactor power	17% APRMS
Total Steam flow	2.5 million lbm/hr
Total Feed flow	2.4 million lbm/hr
Reactor water level	+35 inches
Reactor pressure	940 psig

Which of the following statements is correct?

a. The RWM must be manually bypassed before inserting a control rod.

b. The RWM will indicate out of sequence rod motion only.

c. The RWM will not produce control rod blocks or indicate out of sequence rod motion.

d. The RWM will produce control rod blocks and indicate out of sequence rod motion.

QUESTION: 079 (1.00)

Limerick unit one is at 100% power when a small steam leak develops which causes drywell pressure to increase to 2 psig. The reactor scrams and reactor water level decreases to +15 inches before being restored to the normal band. Select the NSSSS group isolations that should have occurred according to plant design.

a. Groups IA,B

b. Groups IVA,B

c. Groups IIA,B

d. Groups VIA,B

QUESTION: 080 (1.00)

A reactor low water level scram occurred on Limerick unit one. Given the following plant conditions:

Reactor Power	75 on range "3" of the IRMS
Reactor Mode Switch	RUN position
Reactor Pressure	656 psig
SDV Bypass Switch	Bypass position
Reactor Water Level	+10 inches

Select the RPS scram signals that are bypassed for the above conditions.

a. APRM downscale, MSIV closure and SDV high water level.

b. IRM Hi-Hi, and TCV fast closure.

c. APRM downscale, MSIV closure and TCV fast closure.

d. IRM Hi-Hi, SDV high water level.

QUESTION: 081 (1.00)

Limerick unit one is operating at 100% reactor power when a total loss of instrument air occurs. Select the operator action(s) which would maximize the time reactor water level remains in the normal operating band.

a. Take manual control of the reactor feed pumps and retain their speed.

b. Isolate the reactor feed pump minimum flow lines.

c. Transfer the feedwater level control transmitter to the alternate level transmitter.

d. Lower the master level control setpoint to prevent a reactor feed pump high level trip.

QUESTION: 082 (1.00)

OT-110 "Reactor Vessel High Level", requires the operator to prevent injection from the condensate pumps NOT required to assure adequate core cooling. Select the appropriate method to prevent injection into the reactor vessel.

a. Trip the reactor feed pumps.

b. Close the reactor feed pump discharge valves.

c. Manually reduce reactor feed pump speed until discharge pressure is less than reactor pressure.

d. Open the reactor feed pump minimum flow valves.

QUESTION: 083 (1.00)

Limerick unit two is operating at 100% power. Which of the following is the expected response of the following primary containment system parameters if a Group VIB "Primary Containment Exhaust to Equipment Compartment" isolation and a Group VIIIB "Miscellaneous Process Lines" isolation inadvertently occurred simultaneously?

a. Drywell air temperature increases; drywell pressure increases; suppression chamber pressure increases; drywell to suppression chamber differential pressure increases.

b. Drywell air temperature remains unchanged; drywell pressure remains unchanged; suppression chamber pressure remains unchanged; drywell to suppression chamber differential pressure remains unchanged.

c. Drywell air temperature increases; drywell pressure increases; suppression chamber pressure decreases; drywell to suppression chamber differential pressure decreases.

d. Drywell air temperature decreases; drywell pressure decreases; suppression chamber pressure remains unchanged; drywell or suppression chamber differential pressure decreases.

QUESTION: 084 (1.00)

While at 55% power, a reactor scram occurred when all eight Main Steam Isolation Valves closed. Following the scram, reactor pressure decreased to 500 psi while water level had dropped to a low of -35 inches and is now at +17 inches. Which of the following systems is injecting water into the vessel? Assume no operator action occurs.

a. Condensate pumps.

b. Reactor feedpumps

c. Low pressure coolant injection.

d. Reactor core isolation cooling

QUESTION: 085 (1.00)

Which of the following statements contain two entry conditions for T-101 RPV control?

a. Drywell pressure above 2 psig, RPV pressure above 1105 psig.

b. Scram condition with power above 4% or unknown, reactor water at +12.5 inches.

c. Scram condition with power above 4% or unknown, reactor water level below 35 inches.

d. Drywell pressure above 1.68 psig, RPV pressure above 1005 psig.

QUESTION: 086 (1.00)

Which of the following is the reason for bypass valve operation upon receiving a main turbine-generator trip at 100% reactor power?

a. Reactor pressure exceeds controlling EHC pressure regulator setpoint.

b. Controlling EHC pressure regulator pressure setpoint exceeds turbine throttle pressure.

c. Turbine first stage pressure exceeds controlling EHC pressure regulator setpoint.

d. Controlling EHC pressure regulator setpoint exceeds reactor pressure.

QUESTION: 087 (1.00)

The "DW Spray Initiation Limit" curve must be checked prior to initiating Drywell sprays for containment pressure control, Drywell temperature control or control of an explosive atmosphere in the containment. Why must conditions be on the safe side of this curve prior to spraying the drywell?

a. When the combination of drywell temperature and pressure is on the unsafe side, suppression chamber design pressure may be exceeded due to the inability of downcomer vacuum breakers to relieve pressure during depressurization.

b. When on the unsafe side of the curve, drywell spray initiation may result in uncontrollable depressurization due to evaporative cooling of non-condensables.

c. Drywell sprays should not be initiated when conditions are in the unsafe region because the energy suppression capability of the suppression pool has not yet been depleted.

d. Initiating sprays on the unsafe side of the curve will result in drywell spray header failure due to high drywell temperature/pressure conditions.

QUESTION: 088 (1.00)

Limerick unit one is operating at 100% power when operators identify that main condenser vacuum has decreased from 25 to 23 inches of mercury. Identify a cause for this event.

a. Decrease in circulating water temperature.

b. Decrease mechanical vacuum pump speed.

c. Increase in seal steam pressure.

d. Decrease in off-gas system flow rate.

QUESTION: 089 (1.00)

Procedure T-111, Level Restoration, is entered when reactor level cannot be maintained above -161". What is the basis for step LR-11 which asks "Is RPV Pressure above 120 psig".

a. To determined whether to inhibit ADS.

b. To determine if entry into procedure T-112, Emergency Blowdown is required.

c. To determine if the Minimum Alternate Flooding (MAF) pressure is met for any number of open SRVs.

d. To determine when injection with the Alternate Subsystems would occur.

QUESTION: 090 (1.00)

Which one of the following situations will allow operators to disregard RPV cooldown rate limits?

a. SRVs are being used to maintain temperature and pressure within the heat capacity temperature limit curve.

b. Drywell pressure is on the UNSAFE side of the Drywell Spray Initiation Limit curve of T-102.

c. RPV pressure is on the UNSAFE side of the Drywell Spray Limit Curve of T-99.

d. Suppression pool level cannot be maintained on the SAFE side of the SRV Tail Pipe Level Limit curve of T-102.

QUESTION: 091 (1.00)

In accordance with T-101, RPV Control-Bases, which one of the following statements is a reason that ADS is inhibited whenever boron injection is required?

a. To prevent a loss of boron from the vessel through the SRVs resulting in a reactivity increase.

b. To prevent a possible power excursion that may result in substantial fuel damage.

c. To prevent an excessive depressurization that would cause the SLC pumps to runout.

d. To prevent an increase in natural circulation resulting in decreased voiding and an increase in power.

QUESTION: 092 (1.00)

A fire has occurred in Limerick Unit 1 with the reactor shutdown and at 0 psig. The RHR system emergency transfer switches have been placed in emergency. During operation of RHR loop "A" in the Shutdown Cooling mode with RHR pump "A" in operation, reactor pressure suddenly increases to 75 psig.

Which of the following is the automatic response of the following RHR system valves?

- F-0008, RHR pump suction valve.
- F-0009, RHR pump suction valve.
- F-007A, RHR pump "A" minimum flow valve.
- F015A, RHR shutdown cooling return isolation valve.

	F-0008	F-0009	F015A	F-007A
a.	closes	closes	closes	closes
b.	as is	as is	as is	as is
c.	as is	as is	as is	closes
d.	closes	closes	closes	opens

QUESTION: 093 (1.00)

Reactor building normal ventilation system has automatically shutdown following a high reactor enclosure pressure. The operator attempted to start a reactor enclosure exhaust fan by placing its OFF/AUTO/RUN switch to the RUN position. WHICH ONE (1) of the following describes the result of the operator's action?

a. The reactor enclosure exhaust fan starts then trips.

b. The reactor enclosure exhaust fan will fail to start.

c. The reactor enclosure exhaust fan discharge damper will open and the exhaust fan will start then trip.

d. The reactor enclosure exhaust fan will start and continue to run.

QUESTION: 094 (1.00)

Initially, the 1A RECW Pump is running (HS to start, then released) and 1B RECW pump is in standby (HS in auto). Which of the following describes the subsequent response of both RECW pumps following a loss of offsite power?

a. The 1B pump will automatically start when D*44 reenergizes. The 1A pump will remain deenergized.

b. The 1A pump will automatically restart 20 seconds after D*34 reeneergizes. 1B pump will start 20 sec after D*44 reenergizes.

c. Neither pump will automatically start. Either pump can be manually started, after D*34 and D*44 re-energize respectively.

d. Both pumps will automatically restart after D*34 and D*44 re-energize, respectively.

QUESTION: 095 (1.00)

For the following plant conditions:

- Reactor is shutdown
- Reactor vessel water level has decreased to -125 inches due to a coolant leak.
- Drywell pressure is 2.0 psig.

Which of the following statements describe the response of the Drywell Chilled Water System if the 1A drywell chilled water system was operating before the event.

a. Only components inside the drywell have lost flow, the 1A drywell chilled water system continues to run.

b. The 1A drywell chilled water system continues to supply cooling water to all components.

c. All components served by the drywell chilled water system have lost flow both inside and outside of the drywell. The 1A drywell chilled water pump and compressor continues to run.

d. The 1A drywell chilled water system has tripped.

QUESTION: 096 (1.00)

During single loop operation (greater than 24 hours), Technical Specifications require conservative adjustments of certain limits. SELECT the ONE limit listed below that is adjusted for long term single loop operation. ASSUME no instrument channels have been declared inoperable.

a. EOC RPT setpoint.

b. Maximum combined flow limiter setting.

c. MCPR Safety Limit.

d. APLHGR Thermal Limit.

QUESTION: 097 (1.00)

The secondary containment ventilation system is in a normal operating lineup when all instrument air is lost. What affect, does this event have on the secondary containment ventilation system?

a. The secondary containment supply and exhaust dampers isolate. The RERS and SBGT systems supply and exhaust dampers open. RERS and SBGT fans do not start.

b. The secondary containment supply and exhaust dampers isolate. The RERS and SBGT systems supply and exhaust dampers open. RERS and SBGT fans start.

c. The secondary containment supply dampers fail open and the exhaust dampers to fail shut. The RER and SBGT systems supply and exhaust dampers open and start.

d. No effect, the reactor building ventilation system continues to operate.

QUESTION: 098 (1.00)

WHICH ONE (1) of the following describes the Heat Capacity Level Limit?

a. The HIGHEST suppression pool level after RPV depressurization that will NOT cover the downcomer vacuum breakers.

b. The LOWEST suppression pool level after RPV depressurization that will NOT cover the downcomer vacuum breakers.

c. The HIGHEST suppression pool level which has sufficient water to provide long term core cooling and achieve a primary temperature of 100 degrees fahrenheit.

d. The LOWEST suppression pool level at which has sufficient water to accomplish an RPV depressurization.

QUESTION: 099 (1.00)

According to SE-1 "Remote Shutdown" SELECT ONE of the following RCIC system interlocks which remain functional when control is transferred to the remote shutdown panel.

a. RCIC turbine trip on overspeed.

b. Steam supply valve closure on high reactor water level.

c. Transfer of suction from CST to suppression pool.

d. Start on low reactor water level (-38").

QUESTION: 100 (1.00)

Which of the following are the administrative controls for the Level II locked high radiation area keys?

a. Keys are controlled by HP supervision and require approval of HP supervision and shift management for issue.

b. Keys are controlled by HP supervision and require only the approval of health physics supervision prior to issue.

c. Keys are controlled by shift management and require approval from shift management for issue.

d. Keys are controlled by shift management and require approval of HP supervision and shift management for issue.

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

A N S W E R   K E Y

MULTIPLE CHOICE

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

ANSWER KEY

046 a

047 b

048 c

049 c

050 d

051 d

052 b

053 a

054 b

055 b

056 b

057 c

058 c

059 b

060 b

061 b

062 d

063 d

064 a

065 b

066 b

067 b

068 d

069 c

070 b

071 a

072 d

073 a

074 d

075 d

076 b

077 d & b Ken [illegible] 01/21/95

078 b

079 d

080 b

081 b

082 b

083 b

084 a

085 a

086 a

087 b

088 d

089 d

090 d

ANSWER KEY

091 b

092 b

093 d

094 d

095 a

096 c

097 b

098 d

099 a

100 a

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

ATTACHMENT 2

PECO ENERGY COMMENTS AND NRC RESOLUTION OF FACILITY COMMENTS

COMMENT: Question #35

Accept answers "a" and "b" as correct

NRC Resolution: Comment accepted

COMMENT: Question #49

Accept answers "b" and "c" as correct

NRC Resolution: Comment accepted. In addition to the written comments, the examiners reviewed control wiring diagrams with facility personnel and concluded that both answers could be correct. Facility personnel agreed to correct the training material.

COMMENT: Question #77

Accept answers "b" and "d" as correct

NRC Resolution: Comment accepted

ATTACHMENT 3

SIMULATION FACILITY REPORT

Facility License: NPF-39

Facility Docket No: 50-352

Operating Test Preparation and Administration: August 8, 1995

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information that may be used in future evaluations. No licensee action is required in response to these observations.

During the conduct of the simulator portion of the operating tests, the following items were observed:

ITEM	DESCRIPTION
NONE	