12/27/99

NOTE TO: NRC Document Control Desk
Mail Stop 0-5-D-24

FROM: Virgil Curley, Licensing Assistant
Operating Licensing Branch, RI

SUBJECT: OPERATOR LICENSING EXAMINATION ADMINISTERED ON
March 12 15-19, 1999 AT Limerick Unit 1 & 2
DOCKET #50-352/352

On March 12-15-19 1999 Operator Licensing Examinations were administered at the referenced facility. Attached, you will find the following information for processing through NUDOCS and distribution to the NRC staff, including the NRC PDR:

Item #1 - a) Facility submitted outline and initial exam submittal, designated for distribution under RIDS Code A070.

b) As given operating examination, (scenario & final written) designated for distribution under RIDS Code A070.

Item #2 - Examination Report with the as given written examination attached, designated for distribution under RIDS Code IE42.

A070

James D. von Suskil
Vice President
Limerick Generating Station

Find Scenario & Written

PECO NUCLEAR
A Unit of PECO Energy

PECO Energy Company
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10CFR55.57

March 24, 1999

Docket Nos. 50-352
50-353
License Nos. NPF-39
NPF-85

Mr. Hubert J. Miller, Regional Administrator
U. S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

SUBJECT: Limerick Generating Station
Written Examination Comments

Dear Mr. Miller:

The NRC Initial License Written Examinations administered on March 12, 1999 at the Limerick Generating Station were overall comprehensive and thorough. Your organization's cooperation and assistance during development was beneficial for ensuring a fair and reliable evaluation instrument.

Attached are the facility comments to selected questions. These comments are being submitted using the guidance of NUREG 1021, ES-402, to clarify areas where alternative answers may be considered. References are attached to support the recommendations.

If there are any questions concerning these comments, please contact Mr. Pete Orphanos at (610) 718-4010.

Sincerely,

Enclosure

A070

cc: Richard J. Conte, Chief, Operator Licensing & Human Performance Branch,
Division of Reactor Safety, Region 1, NRC
J. H. Williams, USNRC, Region 1
S. Dennis, USNRC Region 1
A. L. Burritt, USNRC Senior Resident Inspector, LGS
Document Control Desk, USNRC, Washington, DC

bxc: M. P. Gallagher - GML 5-1
J. A. Hutton - GML 5-1
W. A. Texter - SB4-5
G. D. Edwards - 62A-1
J. J. Stankiewicz - LTC1-1
P. M. Orphanos - LTC1-1
Commitment Coordinator - 62A-1
Correspondence Release Point - SMB 1-2
PA DEP BRP Inspector - SSB 2-4
R. Brobst - Medical PPC2-1

QUESTION: 54 (RO/SRO)

Unit 2 Remote Shutdown Panel is manned due to a fire in the MCR.

- Drywell pressure: 2.5 psig
- DIV 3 DC power lost

WHICH ONE of the following states available pressure control?

a. "2A", "2C", or "2N" SRV
b. "2S", "2M", or "2K" SRV
c. "2A", "2C", or "2N" SRV only after Instrument Air backup
d. "2S", "2M", or "2K" SRV only after Instrument Air backup

ANSWER: C
REFERENCE: LLOT-0120

FACILITY RECOMMENDATION: Accept A or C as correct

JUSTIFICATION:

With a high drywell pressure condition present, all SRVs are still operable for automatic pressure control at the respective overpressure lift setpoints. The question does not specify that the candidate must discriminate between automatic or manual; both of which are available pressure control modes. The "C," "A," and "N" SRVs are associated with the RSP. They will be available for automatic pressure control prior to Instrument Air backup, and automatic and manual control after Instrument Air backup.

REFERENCE ATTACHED TO SUPPORT FACILITY RECOMMENDATION:

- LGS Technical Specifications LCO 3.4.2

JUST TO SHOW LIFT PRESSURES

3/4.4.2 SAFETY/RELIEF VALVES

LIMITING CONDITION FOR OPERATION

3.4.2 The safety valve function of at least 11 of the following reactor coolant system safety/relief valves shall be OPERABLE with the specified code safety valve function lift settings:*#

4	safety/relief valves @ 1170 psig ±1%
5	safety/relief valves @ 1180 psig ±1%
5	safety/relief valves @ 1190 psig ±1%

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

a. With the safety valve function of one or more of the above required safety/relief valves inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

b. With one or more safety/relief valves stuck open, provided that suppression pool average water temperature is less than 105°F, close the stuck open safety/relief valve(s); if unable to close the stuck open valve(s) within 2 minutes or if suppression pool average water temperature is 110°F or greater, place the reactor mode switch in the Shutdown position.

c. With one or more safety/relief valve acoustic monitors inoperable, restore the inoperable acoustic monitors to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.4.2.1 The acoustic monitor for each safety/relief valve shall be demonstrated OPERABLE with the setpoint verified to be 0.20 of the full open noise level## by performance of a:

a. CHANNEL FUNCTIONAL TEST at least once per 92 days, and a
b. CHANNEL CALIBRATION at least once per 24 months**.

4.4.2.2 At least 1/2 of the safety relief valves shall be removed, set pressure tested and reinstalled or replaced with spares that have been previously set pressure tested and stored in accordance with manufacturer's recommendations at least once per 24 months, and they shall be rotated such that all 14 safety relief valves are removed, set pressure tested and reinstalled or replaced with spares that have been previously set pressure tested and stored in accordance with manufacturer's recommendations at least once per 54 months.

---

* The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures.

** The provisions of Specification 4.0.4 are not applicable provided the Surveillance is performed within 12 hours after reactor steam pressure is adequate to perform the test.

\# Up to 2 inoperable valves may be replaced with spare OPERABLE valves with lower setpoints until the next refueling.

Initial setting shall be in accordance with the manufacturer's recommendation. Adjustment to the valve full open noise level shall be accomplished during the startup test program.

FEB 12 1996

MOD - REMOTE S/D PANEL OPERATION

Q 54

FAX

PECO Nuclear
Limerick Training Center
341 Longview Road
Linfield, PA 19468

Date 4/9/99

Number of pages including cover sheet ___

To: HERB WILLIAMS

Phone
Fax Phone
CC:

From: PETE ORPHANOS

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REMARKS:

☐ Urgent ☒ For your review ☐ Reply ASAP ☐ Please comment

QUESTION COMMENTS

Q-54

QUESTION: 54 (RO/SRO)

Unit 2 Remote Shutdown Panel is manned due to a fire in the MCR.

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a. "2A", "2C", or "2N" SRV
b. "2S", "2M", or "2K" SRV
c. "2A", "2C", or "2N" SRV only after Instrument Air backup
d. "2S", "2M", or "2K" SRV only after Instrument Air backup

ANSWER: C
REFERENCE: LOT-1563

FACILITY RECOMMENDATION: Accept A or C as correct

JUSTIFICATION:

Under the given conditions, SRVs "A," "C," and "N" are operable for automatic (pressure) actuation and will be operable for manual operation from the Remote Shutdown Panel (RSP) after restoration of pneumatics. The question provides no restriction on the mode of pressure control to be considered, and A or C is correct.

SRVs "S," "H," and "M" are also operable for pressure actuation; however, choices "B," and "D" are incorrect for the following reasons:

1. The stem of the question restricts the candidates' responses to those SRVs associated with the RSP. Only SRVs "A," "C," and "N" are associated with and indicate at the RSP,

2. The setpoint for the "N" SRV is 1170 psig and the setpoint for the "S," "H," and "M" SRVs is 1180 psig. With the reactor shut down, the heat removal capacity of the "N" SRV (870,000 LB/hr or 5.8%) exceeds the expected decay heat load. It will lift and reduce pressure; preventing the "S," "H," and "M" SRVs from controlling pressure, and

3. Procedure SE-1, "REMOTE SHUTDOWN" stipulates in Step 4.4.1 that the "A," "C," and "N" SRVs are the mode of pressure control.

Choices "A" and "C" are the only correct answers.

REFERENCE ATTACHED TO SUPPORT FACILITY RECOMMENDATION:

SE-1, "REMOTE SHUTDOWN" Section 4.4 - PRESSURE CONTROL

P&ID M-41, Sheet 6, Table II - Unit 2 SRV Setpoints

LGS UFSAR Table 5.2-2, SRV Sepoints and Capacities

D54

4.4 REACTOR PRESSURE CONTROL

4.4.1 Manually **OPERATE** the following Main Steam Relief Valves (SRVs) to control Reactor pressure between 990 to 1096 psig:

- PSV-*F013A
- PSV-*F013C
- PSV-*F013N

4.4.2 IF SRVs fail to operate,
THEN **REFER TO** SE-1-1, Protected Depressurization Control (Long Term Gas Supply).

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Table 5.2-2

NUCLEAR SYSTEM SAFETY/RELIEF VALVE SETPOINTS

NO. OF VALVES[1]	SPRING SET PRESSURE (psig)	ASME RATED CAPACITY AT 103% REFERENCE PRESSURE OF 1090 psig (lb/hr each)
4	1170	870,000
5	1180	870,000
5	1190	870,000

(1) Five of the SRVs serve in the automatic depressurization function.

TABLE I

SAFETY/RELIEF VALVES AND ASSOCIATED EQUIPMENT LOCATION AND SUFFIX ASSIGNMENT

DETAIL No.	STEAM LINE	RELIEF VALVE	VACUUM BREAKER	ACCUM	N	OUTLET TE	COMPUTER INPUT	ACTIVE SENSOR ZE	PASSIVE SENSOR ZE	PRE-AMP ZT	PRE-AMP ZT ENCLOSURE	SI C CH
1	A	☼ 1F013A	1F037A 1F097A	1AT003	1F036A	1N004A	C1259	11SA-1	11SA-2	11SA	1BS921	A
	B	1F013B	1F037B 1F097B	—	—	1N004B	C1271	11SB-1	11SB-2	11SB	1BS921	B
	C	☼ 1F013C	1F037C 1F097C	1CT003	1F036C	1N004C	C1272	11SC-1	11SC-2	11SC	1AS921	A
	D	1F013D	1F037D 1F097D	—	—	1N004D	C1273	11SD-1	11SD-2	11SD	1BS921	B
2	A	⊗ 1F013E	1F037E 1F097E	1ET003	1F036E	1N004E	C1274	11SE-1	11SE-2	11SE	1BS921	A
	B	1F013F	1F037F 1F097F	—	—	1N004F	C1275	11SF-1	11SF-2	11SF	1BS921	B
	C	1F013G	1F037G 1F097G	—	—	1N004G	C1276	11SG-1	11SG-2	11SG	1AS921	A
	D	⊗ 1F013H	1F037H 1F097H	1HT003	1F036H	1N004H	C1277	11SH-1	11SH-2	11SH	1AS921	B
3	A	1F013J	1F037J 1F097J	—	—	1N004J	C1278	11SJ-1	11SJ-2	11SJ	1BS921	A
	B	⊗ 1F013K	1F037K 1F097K	1KT003	1F036K	1N004K	C1279	11SK-1	11SK-2	11SK	1BS921	B
	C	1F013L	1F037L 1F097L	—	—	1N004L	C1280	11SL-1	11SL-2	11SL	1AS921	A
	D	⊗ 1F013M	1F037M 1F097M	1MT003	1F036M	1N004M	C1281	11SM-1	11SM-2	11SM	1AS921	B
4	A	SPARE	—	—	—	—	—	—	—	—	—	—
	B	☼ 1F013N	1F037N 1F097N	1NT003	1F036N	1N004N	C1282	11SN-1	11SN-2	11SN	1BS921	A
	C	—	—	—	—	—	—	—	—	—	—	—
	D	⊗ 1F013S	1F037S 1F097S	1ST003	1F036S	1N004S	C1283	11SS-1	11SS-2	11SS	1AS921	B

⊗ RELIEF VALVES FOR AUTOMATIC DEPRESSURIZATION SYSTEM (ADS), VALVES E,J,K,M,S

☼ CONTOL PROVIDED IN REMOTE SHUTDOWN SYSTEM FOR VALVES A,C,N

TABLE II

VALVE PRESSURE SETTING

SET PRESS. (PSIG)	RELIEF VALVE 1F013
1170	H,J,L,N
1180	D,E,K,M,S
1190	A,B,C,F,G

TABLE III

STEAM FLOW INSTRUMENTATION LINE

MS LINE "A"	"B"	"C"	"D"
1" DCA-135	-139	-143	-147
1" DCA-136	-140	-144	-148
1" DCA-137	-141	-145	-149
1" DCA-138	-142	-146	-150

TABLE IV

STEAM FLOW TRANSMITTER LOCATION

TABLE V

STEAM FLOW INSTRUMENTATION

QUESTION: 58 (RO/SRO)

Recirc pumps are required to be tripped during a loss of Instrument Air

WHICH ONE of the following states the basis for this action?

a. loss of Recirc M-G set winding cooling
b. loss of Recirc M-G set oil cooling
c. loss of Recirc pump seal cooling
d. loss of Recirc pump oil cooling

ANSWER: A
REFERENCE: ON-119, "LOSS OF INSTRUMENT AIR"

FACILITY RECOMMENDATION: Accept A and C as correct

JUSTIFICATION:

Following a loss of Instrument Air, the Recirc Pump Seal Stage Control Valves HV-46-*15 A(B) fail closed. The purpose of the seal stage flow is to maintain the seals cleaned and cooled. Without seal stage flow, the seals are operating with degraded cooling. Both A and C describe valid reasons to shut down the Recirc pumps.

REFERENCE ATTACHED TO SUPPORT FACILITY RECOMMENDATION:

P&ID M-46
LGS Design Basis Document DBD L-S-19

PECO Nuclear
LIMERICK GENERATING STATION

ON-119 LOSS OF INSTRUMENT AIR - BASES CM-1

1.0 SYMPTOMS

1.1 Both Instrument Air Header low pressure alarms.

BASIS
Both Instrument Air Header low pressure annunciators alarming (*18-B(C)-2) indicates that both the *A and *B Instrument Air Headers are less than the alarm setpoint of 85 psig. Air systems redundancy has failed to maintain at least one source of Instrument Air at normal pressure to critical plant valves and instrumentation. Consequently, plant stability is threatened.

1.2 Scram pilot air header low pressure alarm.

BASIS
This alarm (*08-D-5) is indicative of a low Instrument Air header pressure. Pressure is sensed downstream of a pressure control valve which reduces normal Instrument Air pressure to 70 to 75 psig. This alarm annunciates at 65 psig.

2.0 OPERATOR ACTIONS

2.1 **IF** any of the following compressors are not running,
THEN START them:

- *A Instrument Air Compressor
- *B Instrument Air Compressor
- Service Air Compressor

BASIS
These compressors should be running and loaded (automatically) at receiver pressures less than 97 psig. A compressor not running may be a failure to auto start, and a manual start could restore Instrument Air pressure.

Q 58

2.2 **MONITOR** the following instrument air pressure indications:

- PI-15-*20A, "*A Instrument Air Header Pressure" (PX), at *0C655
- PI-15-*20B, "*B Instrument Air Header Pressure" (PX), at *0C655

BASIS
Pressure indicators PI-15-*20A(B) indicate instrument air pressure downstream of the instrument air dryers and are indicative of actual pressure on the instrument air header.

- Computer point G500 (C*130), "*A Instrument Air Receiver Lower Pressure"
- Computer point G501 (C*131), "*B Instrument Air Receiver Low Pressure"

BASIS
G500 and G501 change from NORMAL to LO at 80 psig as measured at the instrument air receivers. These computer points can help determine if the loss of instrument air is resulting from a problem with the instrument air dryers or the instrument air compressor.

2.3 **IF** both PI-15-*20A, "Instrument Air Header Pressure Indicator" (PX), **AND** PI-15-*20B "Instrument Air Header Pressure Indicator" (PX), at *0C655 are less than 85 psig,
THEN PERFORM the following:

2.3.1 **REDUCE** reactor power per Reactor Maneuvering Shutdown Instructions to less than 45%.

BASIS
Reducing reactor power will reduce feedwater flow rate and provide the feed pump control system greater margin to maintain adequate feed to the reactor should feed pump or condensate pump minimum flow valves start to drift open on low instrument operating air pressure. Also, a reactor scram, should it occur, would be a less severe transient when initiated at a lower reactor power.

2.3.2 **MONITOR** control rod positions for inadvertent inward drifting via Control Rod Position Report
AND ROD DRIFT (*08-F-4) alarm.

2.3.3 **IF** control rods drift,
THEN manually **SCRAM** the reactor
AND PLACE Mode Switch in "SHUTDOWN"
AND ENTER T-100, SCRAM.

BASIS
Low Instrument Air pressure could cause CRD HCU scram valves to drift open, resulting in the associated control rods to insert. Operation at power with an abnormal rod pattern could result in a highly undesirable core power distribution.

2.3.4 **MONITOR** reactor water level
AND reactor feedwater flow for possible loss of feedwater due to condensate/RFPT min. flow valves failing open.

BASIS
The condensate pump minimum flow valve and the reactor feed pump minimum flow valves fail open on a loss of operating air. Should any of these valves drift open while at high power, a loss of feed in excess of feed system reserve capacity could result.

2.3.5 **IF** reactor water level drops,
THEN ENTER OT-100
AND EXECUTE concurrently.

BASIS
OT-100, Reactor Low Level, gives the immediate operator actions for low reactor water level.

2.3.6 **MONITOR** feedwater string operation for loss of feedwater heating.

BASIS
The dump valves associated with the feedwater heaters fail open on a loss of operating air. Should any of these valves drift open, feedwater heating would be reduced, and increased feed subcooling could elevate core thermal power above the 100% load line.

2.3.7 **IF** feedwater heating is lost
OR partially lost,
THEN ENTER OT-104
AND EXECUTE concurrently.

BASIS
OT-104, Unexpected/Unexplained Reactivity Insertion, gives the immediate operator actions for a reactivity insertion resulting from a loss of feedwater heating.

2.3.8 **MONITOR** condenser vacuum for possible loss of vacuum.

BASIS
The steam jet air ejector steam supply pressure control valves and air ejector discharge (recirc to the condenser) pressure control valves fail open on a loss of operating air. The level control valves associated with the offgas preheater, after condenser, and hold-up pipe drains fail closed. Should any of these valves drift to their failed position, condenser vacuum could be adversely affected.

2.3.9 **IF** condenser vacuum drops,
THEN ENTER OT-116
AND EXECUTE concurrently.

BASIS
OT-116, Loss of Condenser Vacuum, gives the immediate operator actions for loss of condenser vacuum.

WARNING

With Service Air header isolated from the Service Air compressor, Backup Service Air must be available to the affected Unit to ensure a continued supply of breathing air **AND** to refuel floor seals.

2.4 **ENSURE** Backup Service Air is in service
AND can supply the affected Unit Service Air header.

BASIS
Service Air header will be isolated from the Service Air compressor on a low Instrument Air condition. Backup Service Air should be in service and selected to the appropriate Unit so that air will be supplied to users such as breathing air and fuel pool inflatable seals.

2.5 **DISPATCH** operator to:

2.5.1 **VERIFY** TECW cooling water available to compressors which will **not** start
AND remain loaded.

BASIS
A loss of compressor cooling is the most likely source of compressor trouble.

2.5.2 **MONITOR** *A(B) Instrument Air Dryer prefilter
AND after filter differential pressures at *0C130A(B).

2.5.3 **IF** *A(B) Instrument Air Dryer prefilter
OR after filter differential pressures are greater than 5 psid,
THEN PLACE appropriate standby filter in service per S15.6.E

BASIS
Clogged air dryer filters could be at fault. Valving into service the standby filters takes relatively little time.

2.5.4 **CLOSE** 15-*042, "Service Air Comp Air Receiver Outlet" (328-T1-217/357-T5-217).

BASIS
Both Instrument Air receivers less than 70 psig should cause the automatic Service Air header isolation valve to close, dedicating the output of the Service Air compressor to the Instrument Air system. Should a fault exist downstream of the automatic isolation valve and that valve not fully close, Service Air system capacity as a backup source of air could be degraded.

NOTE

1. Following step assumes Service Air was backing up "A" Instrument Air Header at time of pressure loss.

2. **IF** Service Air was backing up "B" Instrument Air header,
THEN 15-*009A, "Service Air To "A" Inst Air Tie Vlv," would be closed
AND 15-*009B, "Service Air To "B" Inst Air Tie Vlv," would be opened.

2.5.5 **IF** Service Air compressor is still operating
AND both Instrument Air headers are depressurized,
THEN PERFORM the following:

1. **CLOSE** 15-*009A(B), "Service Air To A(B) Inst Air Tie Vlv" (328-T1-217/357-T5-217).

2. **OPEN** 15-*009B(A), "Service Air To B(A) Inst Air Tie Vlv", in an attempt to repressurize the header (328-T1-217/357-T5-217).

BASIS
In the case of a failure of B(A) Instrument Air compressor and a coincident failure of A(B) Instrument Air header (i.e. line break), it would be appropriate to isolate Service Air to the A(B) header and to valve it into the B(A) header.

2.5.6 **IF** Service Air compressor discharge pressure is greater than Instrument Air compressor discharge pressures,
THEN OPEN 15-*027, "Service Air to Inst Air Tie Vlv" (328-T1-217/357-T5-217).

BASIS
Service air pressure should not be significantly greater than Instrument Air header pressure since the Service/Instrument Air header cross-tie check valve augments Service Air to the Instrument Air header. However, if the cross-tie check valve was to malfunction (not open), Service Air pressure could be greater than Instrument Air pressure. Only in this situation should the cross-tie check valve be bypassed to restore the backup air supply to Instrument Air.

CAUTION

1. Jeopardizing an operating Unit by supplying Instrument Air to the other Unit should be avoided.

2. **IF** the Instrument Air problem has been identified
AND the operating Unit will **not** be adversely affected by cross connection,
THEN the following step should be used.

2.5.7 **IF** Instrument Air pressure has **not** been re-established
AND the other Unit's Instrument Air system is available,
THEN **CROSS CONNECT** Instrument Air between Units 1 and 2 as follows:

1. **MONITOR** operating Unit Instrument Air system during cross connection efforts.

2. **ENSURE** 15-0563A, "A Inst Air Hdr To & From Unit #2 Turbine Area Stop Valve" (277-T9*200),
AND 15-0563B, "B Inst Air Hdr To & From Unit #2 Turbine Area Stop Valve" (277-T9*200), open.

3. Slowly **OPEN** 15-0100A, "Unit 1 To Unit 2 Inst Air A Hdr Tie Valve" (258-A8-200),
AND 15-0100B, "Unit 1 To Unit 2 Inst Air B Hdr Tie Valve" (258-A8-200).

4. **IF** operating Unit Instrument Air system performance is degraded,
THEN **TERMINATE** cross connection efforts.

BASIS

If all previous efforts to restore Instrument Air have failed, cross connection between the two Units may be considered. The possible adverse consequences to the non-affected Unit need to be carefully considered prior to cross connecting air systems. An operating Unit could be inadvertently tripped or otherwise unfavorably affected. The malfunction in the affected Unit air system must be identified and understood prior to considering this corrective action. Slowly opening cross connection valves while monitoring the non-affected Unit air system performance should allow termination of the evolution if significant pressure losses or other non-desirable events occur.

2.6 **IF** pressure can **not** be restored to either Instrument Air header,
THEN COMMENCE rapid plant shutdown per GP-4.

BASIS
The plant cannot operate indefinitely without proper pressure present in at least one of the two Instrument Air headers. Should the determination be made that Instrument Air cannot be restored, the plant should be shutdown in a controlled fashion before Instrument Air loss degrades plant systems in a random unpredictable manner.

2.6.1 **WHEN** all control rods are inserted per GP-4,
THEN TRIP both reactor recirculation MG sets.

BASIS
The drywell chilled water system shuts down, and the reactor recirculation pump mechanical seal purge supply isolation valves fail closed on a loss of Instrument Air. The reactor recirc pumps are not needed when the reactor is shut down and should not be operated without seal purge and motor airspace cooling. Also, the turbine building ventilation system shuts down on a loss of Instrument Air. This, in turn, would cause the reactor recirculation MG sets to trip on high air temperature.

NOTE

MSIVs may begin to drift closed.

2.6.2 **IF** Main Condenser can **not** be maintained as a heat sink, **THEN PERFORM** the following:

1. **CLOSE** inboard
   AND outboard MSIVs.

2. **ENSURE** HV-41-*F016, "Main Stm Line Drain Inboard PCIV" (STEAM DRAINS INBOARD),
   AND HV-41-*F019, "Main Stm Line Drain Outboard PCIV" (STEAM DRAINS OUTBOARD), closed at *0C601.

3. **ENTER** T-101 for reactor vessel pressure
   AND level control.

BASIS

The main condenser is not a maintainable heat sink without Instrument Air. The auxiliary boilers become inoperable, the offgas system drain valves fail closed, and the mechanical vacuum pump suction isolation valve fails closed on a loss of Instrument Air. Isolating reactor pressure vessel steam protects the main turbine, condenser and associated auxiliary systems by forcing decay heat to be deposited in the suppression pool where the energy can be dissipated by systems not dependent upon Instrument Air.

NOTE

Placing RECW in service to cool the Drywell will violate primary containment integrity.

2.6.3 **SECURE** Drywell Chilled Water per S87.2.A
AND CONSIDER placing RECW in service to cool the Drywell per S13.6.D.

BASIS
The Drywell Chilled Water System will shut itself down on a loss of Instrument Air and so should be secured in a controlled fashion. RECW backup to DWCW may be able to be placed in service, however, primary containment will be violated. (Ref. 3.3.2)

2.6.4 **MONITOR** secondary containment pressure.

2.6.5 **IF** Reactor Enclosure HVAC isolates,
THEN PERFORM the following:

1. **ENSURE** SGTS maintains secondary containment pressure at least negative 0.25 inches of water pressure.

2. **IF** secondary containment pressure can **not** be maintained
THEN ENTER ON-111
AND EXECUTE concurrently.

BASIS
Reactor building ventilation supply and exhaust dampers fail closed on a loss of Instrument Air, tripping their respective fans. The recirculation and standby gas treatment systems should still function to maintain proper negative secondary containment pressure. The operator should monitor secondary containment pressure to ensure pressure is controlled within Technical Specifications requirements. ON-111, Loss Of Secondary Containment, provides the operator actions in the event secondary containment pressure can not be maintained.

Q58

2.6.6 **MONITOR** following levels
AND TAKE manual action, as necessary, to control level.

- RECW Head Tank

- TECW Head Tank

BASIS
The automatic makeup valves for these tanks fail closed on a loss of Instrument Air.

- Main Condenser Hotwell

BASIS
The coarse and fine condensate makeup and reject valves all fail closed on a loss of Instrument Air.

- Condensate Storage Tank

BASIS
The Condensate Storage Tank (CST) makeup isolation valve fails closed. Additionally with the condensate makeup and reject valves failing closed, if a condensate pump is in service, CST level could actually rise if a reject valve leaks by.

2.6.7 **MINIMIZE** evolutions that discharge water to Radwaste.

BASIS
The radwaste processing systems are inoperable without Instrument Air. Any water collected by the drain collection systems will accumulate in the Floor Drain Collection Tank, the Equipment Drain Collection Tank, and the Chemical Waste Tank. Unnecessary depletion of the available storage capacity of these tanks is undesirable.

2.6.8 **SECURE** Auxiliary Boilers per S21.2.A.

BASIS
The Auxiliary Boilers will shut themselves down on a loss of Instrument Air and so should be secured in a controlled fashion.

2.6.9 **MONITOR** Reactor Pressure.

2.6.10 **IF** Reactor begins to depressurize due to the SSE main steam supply valves PV-C-07-*52
AND PV-C-07-*53 failing open
THEN CLOSE HV-07-*50.

BASIS
The Steam Seal Evaporator main steam supply valves PV-C-07-*52 and PV-C-07-*53 fail open on a loss of air. The Reactor may depressurize through the SSE and through the main steam supply pressure relief valves PSV-07-*51A(B)(C)(D)(E)(F). Closing HV-07-*50 will isolate main steam from the SSE and prevent Reactor Depressurization.

3.0 REFERENCES

3.1 TECHNICAL SPECIFICATIONS

NONE

3.2 INTERFACING PROCEDURES

3.2.1 GP-4, Rapid Plant Shutdown To Hot Shutdown

3.2.2 ON-111, Loss Of Secondary Containment

3.2.3 OT-100, Reactor Low Level

3.2.4 OT-104, Unexpected/Unexplained Reactivity Insertion

3.2.5 OT-116, Loss of Condenser Vacuum

3.2.6 S13.6.D, RECW Operation With Loss of Drywell Chilled Water

3.2.7 S15.6.E, Placing Standby Instrument Air Dryer Prefilter/Afterfilter In Service

3.2.8 S21.2.A, Shutdown of an Auxiliary Boiler

3.2.9 S87.2.A, Normal Shutdown Of The Drywell Chilled Water System

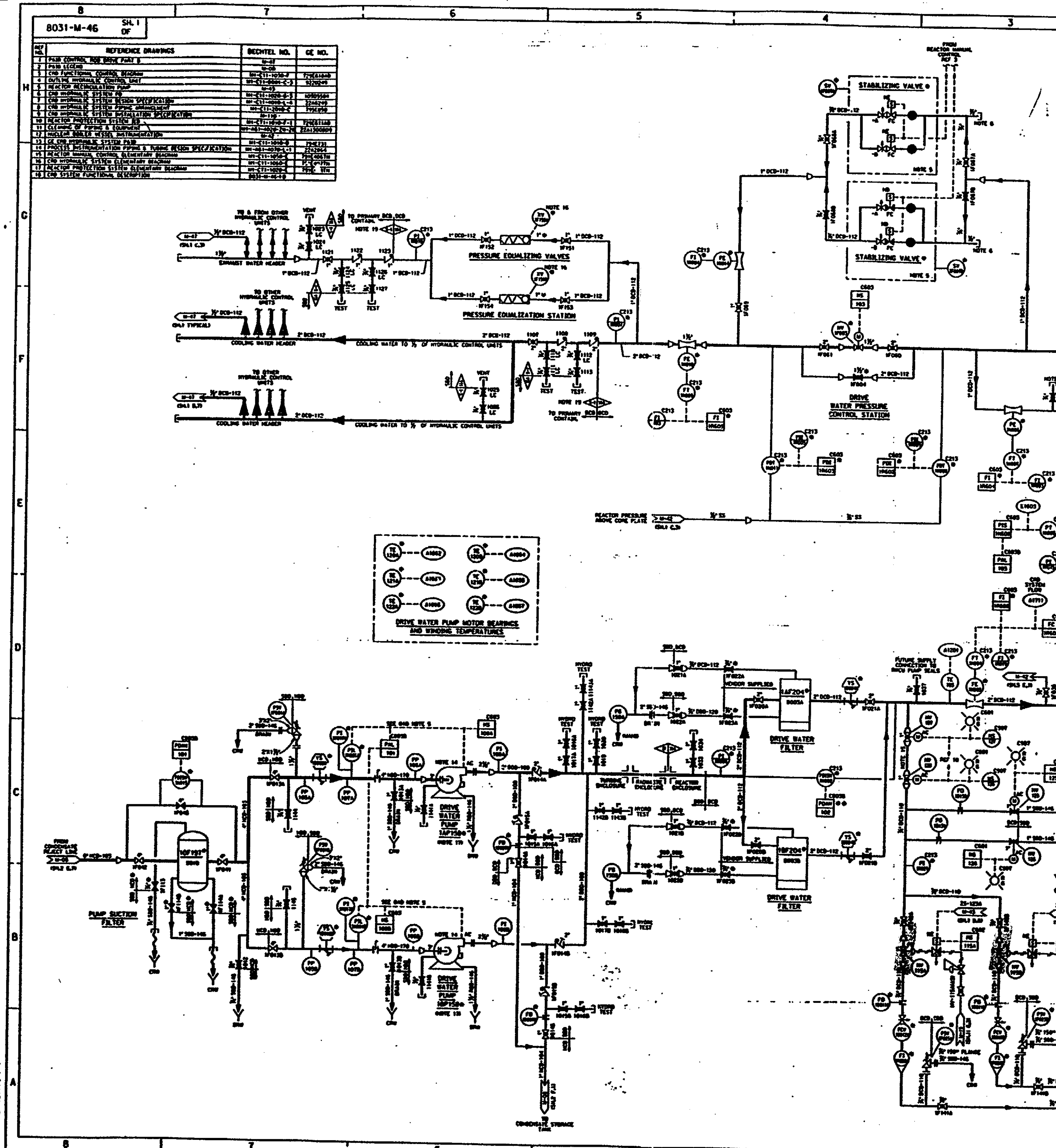
3.2.10 T-100, SCRAM

3.2.11 T-101, RPV Control

3.3 OTHER

3.3.1 **CM-1** SOER 88-01, Rec. #1, T01785

3.3.2 NCR 94-00254



NOTES:

1. THIS SYSTEM IS SEISMIC CATEGORY IIA EXCEPT AS NOTED.
2. THE GE MPL NUMBER FOR THIS SYSTEM IS C11.
3. PROVIDE VENT VALVES WITH CAP ON DISCHARGE SIDE AT ALL SYSTEM HIGH POINTS.
4. PROVIDE DRAIN VALVES WITH CAP ON DISCHARGE SIDE AT ALL SYSTEM LOW POINTS.
5. STABILIZING VALVE 1F009B IS AN ALTERNATE FOR STABILIZING VALVE 1F009A (G,4 & H,4). VALVE 1F007A-B CLOSES ON DRIVE INSERT SIGNAL. VALVE 1F007A-B CLOSES ON DRIVE WITHDRAW SIGNAL, BUT DOES NOT STAY CLOSED DURING SETTLING.
6. PR... ED FOR SYSTEM FLUSHING (G,3 & H,3).
7. AVAILABLE FOR TEMPORARY CONNECTION FOR INSTRUMENT FLUSHING. NO PERMANENT PIPING CONNECTIONS TO BE MADE TO THIS VALVE (F,3).
8. VALVE POSITIONERS SUPPLIED WITH VALVE.
9. ALL INSTRUMENT PIPING AND TUBING SHALL BE INSTALLED IN ACCORDANCE WITH REFERENCE 14.
10. ALL PIPING SHALL BE CONTINUOUSLY SLOPED ¼" PER FOOT EXCEPT FOR MASTER CONTROL STATION PIPING AND SERVICE HEADERS AT HCU'S. ALL HIGH POINTS SHALL BE LOCATED OUTSIDE THE PRIMARY CONTAINMENT.
11. DELETED.
12. FO-1000B IS ACTUALLY 4 ORIFICES CONNECTED IN SERIES.
13. DELETED.
14. PUMP INLET CONNECTION 3"-300# ANSI RF FLANGE. PUMP OUTLET CONNECTION 2½"-900# ANSI RF FLANGE.
15. VALVES MUST BE SEISMIC CATEGORY I AND Q-LISTED. THE ISOLATION SIGNALS MUST CLOSE THE BLOCK VALVES (C,4).
16. FOR 1" DCB-112, VALVES XV-1F150A & B, THE MATING FLANGES WILL BE 1"-1500# RAISED FACE.
17. THIS EQUIPMENT IS BEING MONITORED BY THE VIBRATION MONITORING SYSTEM (VMS). FOR THE TYPE OF SENSORS BEING USED, SEE THE VMS I/O SUMMARY V.P. DWG. 8031-M-247-100.
18. DELETED.
19. THE DCB/DCD PIPING CLASS BREAK FOR PIPE LINE NUMBER 112 ON THIS DOCUMENT HAS BEEN RELOCATED IN ACCORDANCE WITH MOD. 5016. PIPING THAT HAS PREVIOUSLY DCD CLASS PIPE HAS BEEN UPGRADED TO BE EQUIVALENT TO ASME III CLASS 2 REQUIREMENTS. THE DRAWING NUMBERS FOR THE PIPING ISOMETRICS WHICH CONTAIN THIS PIPING WERE NOT CHANGED TO MINIMIZE AFFECTS TO THE EXISTING DOCUMENTATION NUMBERING.
20. DELETED.

NO	DATE	DESCRIPTION	REV'D	CHK'D	APP'D

TABLE OF ADDITIONS & CHANGES
USE ONLY PRINTS SHOWING LATEST DATE

MECHANICAL

P&ID
CONTROL ROD DRIVE HYDRAULIC - PART A
(UNIT 1)

LIMERICK GENERATING STATION
PECO ENERGY CO.

SCALE	DRAWN	DES'D	CHECKED	INSPECTED	APPROVED	DATE
NONE	BECHTEL	BECHTEL	BECHTEL	BECHTEL	BECH / BECH	

APPROVED BECHTEL ____ APPROVED ____

SHEET 1 OF | 8031-M-46 | 42

1 CATEGORY A1

b58

QUESTION: 94 (RO)

I&C testing is being performed

Main Steam Line Flow High channel B calibration functional (ST-2-041-425-2) is in progress

Expected alarm "MAIN STEAM LINE HI FLOW" annunciates

WHICH ONE of the following describes the required MCR alarm responses to this testing?

a. only the unit RO is permitted to acknowledge this alarm
b. only the PRO is permitted to acknowledge this alarm
c. I&C is permitted to acknowledge this alarm with RO concurrence
d. I&C is permitted to acknowledge this alarm without RO concurrence

ANSWER: C

REFERENCE: OM-L-7.1, "ALARMS AND INDICATIONS"

FACILITY RECOMMENDATION: Accept A and C as correct

JUSTIFICATION:

OM-L-7.1 Step 5.1.2 indicates that it is at the Operator's discretion to permit non-operations individuals to acknowledge MCR alarms. The MAIN STEAM HI FLOW trip units provide a Group I MSIV isolation signal which will result in a RPS trip signal. Both RPS and MSIV logic testing requires manual reset by the RO. A RO who treats this key alarm in the same fashion as RPS alarms is taking reasonable and conservative action.

REFERENCE ATTACHED TO SUPPORT FACILITY RECOMMENDATION:

- OM-L-7.1, "ALARMS AND INDICATIONS" Step 5.1.2

5.0 MCR ALARM RESPONSE DURING TESTING

5.1 The responsible MCR Operator shall:

1. Know when alarms will actuate due to testing.

2. Grant permission (at the Operator's discretion) for the acknowledgement/reset of MCR annunciators to non-Operations personnel and ensure adherence to these stated guidelines.

EXCEPTION: Only Licensed personnel shall be permitted to acknowledge alarming RPS annunciators.

5.2 Both the responsible Operator and the test performer shall jointly and independently verify that the respective alarming annunciators to be acknowledged/reset are associated with the respective test.

NOTE: Responsibilities for non-Operations test performers are included in this Section for MCR Operator awareness.

5.3 MCR Operators should enforce the following requirements:

1. The test performer should not impair the Operator's communication pathway (i.e., test performer wears headset over one ear only, etc.).

2. Non-Operations personnel performing tests in the MCR shall:

   a. Discuss expected annunciator response and request permission for the acknowledgement/reset of MCR annunciators prior to the commencement of the respective test. **<<T00848>>**

   b. Receive verbal concurrence from the responsible Operator prior to any respective test manipulations resulting in an RPS actuation (i.e., causing a half scram).

   c. Communicate impending alarms (raise arm) immediately prior to (preferred) or coincident with (acceptable) annunciator alarm receipt associated with the respective surveillance tests. **<<T00848>>**

   d. Receive concurrence from the responsible Operator prior to the acknowledgement/reset of any MCR annunciator.

   e. Inform the responsible Operator of alarming annunciators not associated with the respective test. Testing shall not continue until authorized by the responsible Operator.

   f. Inform the responsible Operator of any annunciators not associated with the respective test which clear during associated resets.

QUESTION: 96 (RO)

Unit 1 is in OPCON 5 with Core Alterations in progress

The Refuel Bridge has lost communication with the RO while removing a bundle from the core.

WHICH ONE of the following describes the status of core alterations?

a. may continue at the discretion of the Fuel Handling Director

b. must be suspended after the bundle is placed in a safe location

c. may continue if the RO monitors fuel movement via the Refuel Floor video equipment

d. must be suspended immediately and the bundle must not be raised or lowered

ANSWER: B

REFERENCE: FH-105, "CORE COMPONENT MOVEMENT—CORE TRANSFERS"

FACILITY RECOMMENDATION: Accept B or D as correct

JUSTIFICATION:

The question stem does not stipulate at what point in the fuel movement sequence (grapple in core to un-grapple in fuel pool) the failure occurs. This information is relevant as follows:

- If the communications failure occurred just after grappling in the core or seating in the fuel pool, then the appropriate action is to stop all motion and not raise the bundle (cannot be lowered), and D is correct.
- If the communications failure occurred with the bundle hanging from the grapple between the core and fuel pool, then the appropriate action could be to maintain the current position or to continue to the fuel pool, and B or D is correct.

The action of placing a bundle in the safe condition does not exclude halting all bridge and mast movement and awaiting further direction. In comparing the actions in B and D for the given scenario, there are no adverse consequences for the additional restrictions imposed in D, and both B and D are correct.

REFERENCES ATTACHED TO SUPPORT FACILITY RECOMMENDATION:

- FH-105, "CORE COMPONENT MOVEMENT—CORE TRANSFERS"
- LGS Technical Specifications LCO 3.9.5

3/4.9.5 COMMUNICATIONS

LIMITING CONDITION FOR OPERATION

3.9.5 Direct communication shall be maintained between the control room and refueling floor personnel.

APPLICABILITY: OPERATIONAL CONDITION 5, during CORE ALTERATIONS.*

ACTION:

When direct communication between the control room and refueling floor personnel cannot be maintained, immediately suspend CORE ALTERATIONS.*

SURVEILLANCE REQUIREMENTS

4.9.5 Direct communication between the control room and refueling floor personnel shall be demonstrated at least once per 12 hours during CORE ALTERATIONS.*

*Except movement of control rods with their normal drive system.

FEB 0 2 1996

Q 96

8.0 LIMITATIONS AND ACTIONS

8.1 Difficulties in handling fuel shall be treated as described in Refueling Bridge Operating Procedure S97.0.M, (Ref. 2.5). Manual operation of refuel platform hoist, when necessary to maintain refuel platform in a safe condition, shall be performed in accordance with Operating Procedure S97.0.L (Ref. 2.6).

8.2 LIMITATION TO CONTINUED CORE ALTERATIONS

NOTE
Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

8.2.1 IF failure of a DOUBLE VERIFICATION is discovered,
THEN Core Alterations shall be terminated
AND Shift Management, NMD Management and Reactor Engineering shall be notified. (Ref. 2.12)

a. Review LR-C-10 and Ensure interim corrective actions are taken prior to resuming Core Alterations

8.2.2 IF communications are lost between the control room and the refueling floor,
THEN terminate core alterations until communication is restored. (T.S. 3.9.5)

8.2.3 IF the source range monitors as required by Tech Spec. 3.9.2 become inoperable,
THEN suspend all core alterations until the SRM's are restored to service.

8.2.4 IF two or more IRMs fail in one channel,
THEN terminate core alterations unless a full scram signal is present
AND the IRMs are in the Trip Condition.

8.2.5 IF a fuel assembly or single fuel rod is dropped or damaged,
THEN terminate core alterations
AND perform the applicable steps of ON-120.
Permission to continue fuel handling operations shall be obtained from the operations - Senior Manager.

Q 96

QUESTION: 98 (RO)

After exiting a posted Contamination Area, you perform a whole body frisk.

- Background Readings are 350 cpm
- Highest reading during whole frisk 470 cpm

WHICH ONE of the following describes the action to be taken?

a. continue with assigned work

b. reperform frisk, if readings are unchanged, contact HP

c. change scrubs, reperform frisk, if readings remain unchanged continue work

d. move to an area of lower background, taking measures to contain any contamination, reperform frisk.

ANSWER: D

REFERENCE: HP-C-818

FACILITY RECOMMENDATION: Accept B or D as correct

JUSTIFICATION:

To remain in this area is to minimize the likelihood of contamination spread and will result in promptly obtaining HP assistance. The action to remain in the area is also supported by procedure HP-C-818-1, "WHOLE BODY FRISKING METHOD" as follows:

1. Note at the top of Page 1
2. Step "F"

Both B and D describe sound, reasonable, and permitted actions.

REFERENCES ATTACHED TO SUPPORT FACILITY RECOMMENDATION:

- HP-C-818, PERSONAL CONTAMINATION MONITORING, DECONTAMINATION, AND REPORTING
- HP-C-818-1, "WHOLE BODY FRISKING METHOD"

WHOLE BODY FRISKING METHOD

Contact Health Physics if personal or clothing contamination is suspected, or if there are problems with equipment or background.

IMPORTANT

A. A proper whole body frisk should take a minimum of two minutes.

B. Verify the equipment is within calibration, has had proper pre-operational checks, and is operating on the X1 scale.

C. The background reading should be less than 300 cpm. Preliminary surveys may be performed in an area ≥300 cpm prior to transit to a <300 cpm background area.

D. Hold probe approximately 1/2 inch from surface being surveyed and move probe slowly (@ 2 inches per second).

E. If an increase in count rate is noted, return the probe to the spot.

F. If count rate increases to greater than 100 counts above background using an HP-210 probe or equivalent or greater than 5000 dpm using a 100 cm^2 probe, remain in area and notify Health Physics.

RECOMMENDED SURVEY HIERARCHY:

1. Survey hands (both sides) before picking up probe.
2. Proceed to survey in the following recommended order:
   a. Head and hard hat (pause at mouth and nose)
   b. Neck and shoulders
   c. Arms (pause at each elbow)
   d. Chest and abdomen
   e. Back, hips, and seat of pants
   f. Legs (pause at each knee).
   g. Shoe bottoms (pause at sole and heel)
   h. Shoe tops
   i. Dosimetry
3. Carefully return probe (face up or side for next person) and leave area.

b. If the background is above acceptable limits for the instrument used, the individual should perform a preliminary frisk of hands and feet. If contamination is suspected, take appropriate measures to contain the contamination, and move to an area of lower background and complete whole body monitoring.

7.2 HEALTH PHYSICS RESPONSE TO SUSPECTED CONTAMINATION

7.2.1 When notified of a suspected personnel contamination, a Health Physics technician shall promptly assist the worker in verifying whether contamination is present. Attachments HP-C-818-8, 9, 11, and 12, Alarm Response Flow Charts, provide guidance for dispositioning a suspected contamination.

7.2.2 Attempt to determine the potential source of the contamination; interview the individual on topics such as:

1. Medical procedures;

2. Work areas and routes traveled;

3. Activities performed by the individual;

4. Area conditions such as leaks or degraded equipment.

7.2.3 Attempt to verify if contamination is internal or external.

1. Use a frisker, or equivalent; survey affected area(s).

a. If external contamination is present, it shall be quantified using a field monitoring instrument.

b. Only ANSI 3.1 qualified individuals may determine that contamination is not present and approve release of workers.

2. If the WBM alarms for the foot, shin, or lower body zone, frisk the shin/lower pants leg and top of shoe.

3. If internal contamination is suspected, notify HP Supervision and proceed to Section 7.4.

4. Require whole body counts as specified in HP-C-628.

7.2.4 Determination of contamination due to short-lived activity (ie. half-life $\leq$ 2 hrs.)

1. Contaminations due to Short Lived Activity shall not be considered a PCR.

7.0 PROCEDURE

7.1 PERSONNEL CONTAMINATION MONITORING

7.1.1 Contaminated Area Exits: A whole body monitor (WBM) or field monitoring instrument should be located as near as practical to each contaminated area exit.

7.1.2 Radiologically Controlled Area (RCA) Exits

1. A WBM(s) and/or a field monitoring instrument(s) shall be located at the approved exits from the Power Block RCA.

2. Satellite RCA Exit (Non Power Block) - Monitoring should be performed in accordance with the posted instructions at each area. Satellite RCAs (i.e., not connected to the Power Block), such as the New Fuel Storage Yard and R/W Storage Pad at LGS and the South Yard at PBAPS, are exempt from monitoring upon exit if all radioactive materials are contained.

7.1.3 Protected Area Exit: Gamma whole body monitor(s) and a field monitoring instrument(s) and monitoring instructions shall be located at the guard house exit from the protected area.

7.1.4 Personnel Contamination Monitoring

1. Individual's entire body shall be monitored.

2. Instructions should be posted at the WBM to provide guidance on the monitoring method and to reinforce the individual's responsibility to contact Health Physics when contamination is suspected. Exhibit HP-C-818-1, Whole Body Frisking Method, and Exhibit HP-C-818-2, WBM Instructions, are provided as examples.

3. When a WBM is available:

   a. If an individual alarms a whole body monitor, then another attempt shall be made.

   b. If an individual receives a second alarm, then HP shall be notified.

4. If a WBM is not available:

   a. If individual is performing a whole body frisk and suspected personnel contamination is detected, then HP shall be notified.

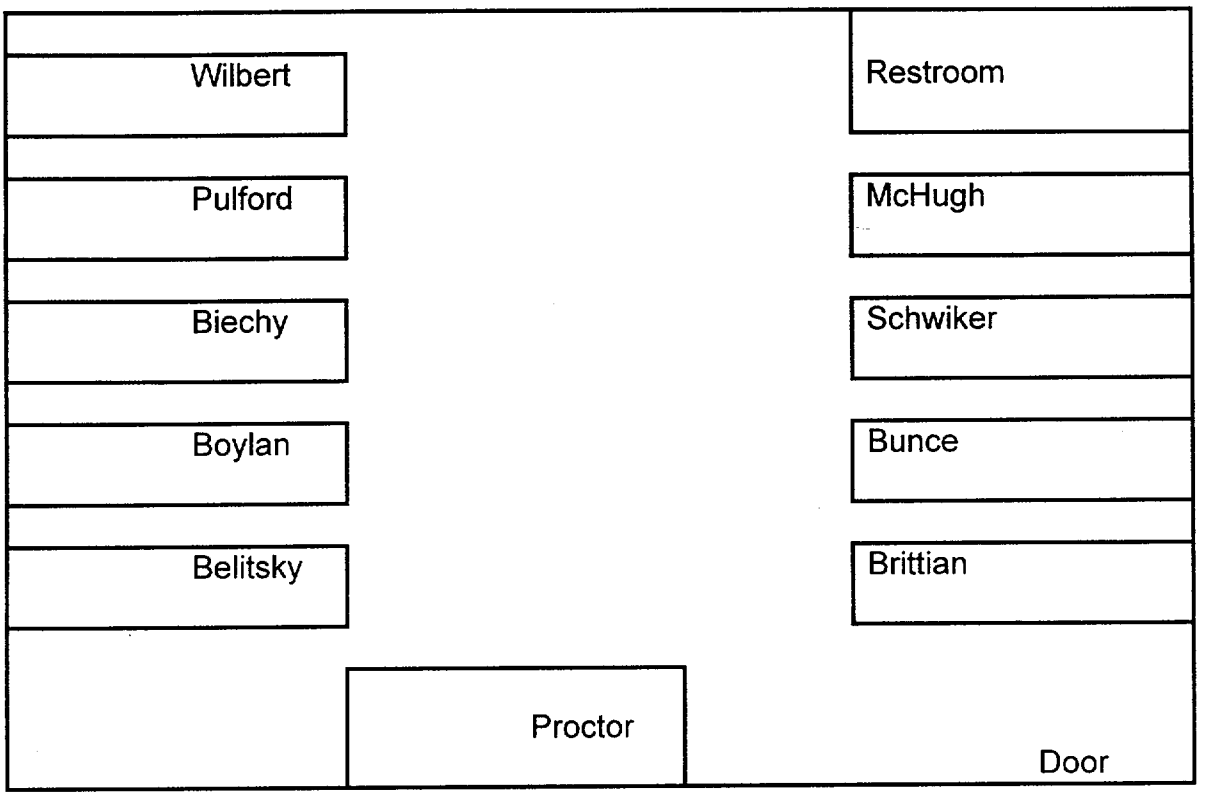
FACILITY: LIMERICK GENERATING STATION EXAM DATE: 3/12/99

98-99 NRC INITIAL LICENSE WRITTEN EXAM ANALYSIS

The questions below were reviewed per Form ES-403-1 following the Written Examination administered to nine (9) candidates on 3/12/99 at Limerick Generating Station. No training deficiencies were determined. The technical material was included in the training received by the candidates, the questions were valid for the examination, and the correct answers will be reviewed with each candidate.

QUESTION #	% MISSED	FACILITY COMMENTS
12	56	All incorrect answers selected were "d". This question tested the increase in Reactor conductivity if a RWCU filter was removed from service. Answer was reviewed for technical accuracy and determined correct as designated.
54	89	All incorrect answers selected were "a". Question regrade submitted, alternate answer is being evaluated.
58	67	All incorrect answers selected were "c". Question regrade submitted, alternate answer is being evaluated.
59	56	Answers "c" and "b" were selected. This question tested the system knowledge on the MSIV Alternate Drain Pathway if one of the Steam Line Drain valves could not be opened. Answer was reviewed for technical accuracy and determined correct as designated.
74	56	All incorrect answers selected were "a". This question tested the administrative procedure guidelines for waiving verifications due to ALARA concerns. Answer was reviewed for technical accuracy and determined correct as designated.
RO 94	60	All incorrect answers selected were "a". Question regrade submitted, alternate answer is being evaluated.
RO 96	80	All incorrect answers selected were "d". Question regrade submitted, alternate answer is being evaluated.
RO98	60	All incorrect answers selected were "b". Question regrade submitted, alternate answer is being evaluated.
SRO 84	50	Both incorrect answers selected were "a". This question tested level control systems used when control transferred to the RSP.. Answer was reviewed for technical accuracy and determined correct as designated.
SRO 85	50	Both incorrect answers selected were "a". This question tested system pressure requirements during Drywall purging. Answer was reviewed for technical accuracy and determined correct as designated.
SRO 95	100	All incorrect answers selected were "a". This question tested the requirements for use of a HP level II key. Answer was reviewed for technical accuracy and determined correct as designated.

WRITTEN EXAM ROOM SEATING CHART



As Administered 3/12/99

W M Tracy

NRC LICENSE WRITTEN EXAM PROCTOR LOG

Facility Proctor: William Tracey. DAVID A. MALINOWSKI

Date: 3/12/99

NRC Examiner: Steve Dennis

Location: LTC Cr #9

START TIME: 09:55

STOP TIME: 1355

Time	Candidate	Q #	Candidate's question(s)	Proctor response
9:10:20	McHugh	20	Does 6 mean anywhere between 02 and 2P?	Between 02 and 2P inclusive. AM
10:35	Wilbert	23	How long does it take Level to get to -150"?	Level was normal and dropped to -150" over several minutes.
10:59	Brittian	39	Is it "A" transmitter or just a transmitter?	a transmitter not "1A" or "2A".
11:50	Wilbert	64	Is spill continuing?	"spill has occurred"
12:04	McHugh	52	Can pressure set be raised to equal value of transmitter?	transmitter fails upscale as evidenced by needle pegged at maximum reading on meter.
1236	WILBERT	14	WAS 'A' RRP SECURED AND ISOLATED BY PERFORMING ALL S-PROCEDURE STEPS?	"A" RRP WAS SHUTDOWN AND ISOLATED PER S-PROCEDURE" DAN
1245	BUNCE	80	DOES QUESTION ASSUME RFP DISCHARGE VALVES CANNOT BE OPERATED?	"RFP DISCHARGE VALVES ARE CLOSED" DAN
1311	McHugh	89	How Long has Rx PRESSURE been 1160 psig?	"Rx PRESSURE AT 1160 psig throughout THE TRANSIENT" DAN
1340	Schwiker	89	DOES DISTRACTOR C. MEAN HPCI CYCLING "AUTOMATICALLY" b/w 12.5"+54"?	"C. MEANS HPCI CYCLING b/w 12.5 & 54" DAN AS SPECIFIED IN SE-1" DAN

1.		51	c		RO		SRO
2.	c	52	abb	76	d	76	
3.	d	53		77		77	c
4.	c	54	aaaaaaaa	78	c	78	a
5.	aa	55	c	79	c	79	
6.		56	cd	80		80	
7.		57		81	b	81	
8.	cccc	58	cccccc	82		82	d
9.		59	cbccc	83	ad	83	c
10.	dbdd	60		84	aa	84	aa
11.	bb	61		85		85	aa
12.	ddddd	62	a	86	b	86	b
13.	a	63	dd	87	c	87	b
14.		64		88		88	d
15.	aac	65	ca	89	d	89	
16.		66	b	90		90	
17.	b	67		91	c	91	d
18.		68		92		92	d
19.		69		93		93	
20.	c	70		94	aaa	94	
21.		71	bcc	95	db	95	aaaa
22.	b	72	b	96	dddd	96	a
23.	ca	73	c	97	c	97	d
24.	d	74	aaaaa	98	bbb	98	a
25.		75		99	a	99	
26.	dcd			100		100	
27.	d						
28.							
29.	b						
30.							
31.							
32.	d						
33.	d						
34.	b						
35.							
36.							
37.	bdd						
38.							
39.							
40.	aaaa						
41.	cddc						
42.	ad						
43.	cc						
44.	b						
45.							
46.							
47.							
48.							
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50.	da						

Facility: LGS Unit 1 Scenario No.: A Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Execute Main Turbine Bypass Valve Exercising (ST-6-001-761-1), Tech Specs, GP-5 (Power Operations), OT-101, (High Drywell Pressure), T-116 (Loss of Condenser Vacuum), T-101 (RPV Control), SE-10 (LOCA), T-111 (Level Restoration), T-112 (Emergency Blowdown)

Initial Conditions: 90%, OPCON 1, D14 EDG blocked for engine repairs

Turnover: Complete Main Turbine Bypass Valve Exercising (ST-6-001-761-1), raise Reactor Power to 100%

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N(PRO)	Main Turbine Bypass Valve Exercising
	108, 89	C(PRO)	BPV fails to open
2	20, C, 90	I(RO)	"1C" APRM Channel fails to 90%
	69	I(PRO)	Turbine Gland Seal Regulator fails closed
	MMC074 100% in 30 min		HP Condenser air leakage
	N/A	R(RO)	Power reduction per OT-116
	244, B	C(RO)	"1A" RFP High Pressure Control valve fails closed
3	252, A	M(ALL)	"A" Feedwater Line rupture inside Primary Containment
	440, A, 8		Recirc Loop "A" rupture (1%)
	456	I(PRO)	RCIC fails to auto start
	440, A, 8		Recirc Loop "A" rupture (8%)
	174, A		"1A" RHR LPCI injection valve (1F017A) fails closed
	183, B	C(PRO)	Core Spray pump "B" fails to auto start

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

I. SIMULATOR OPERATOR INSTRUCTIONS

A. INITIAL SIMULATOR SETUP

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	■ Perform OTM 7.1 Checklist
	■ Reset Simulator to IC-17
	■ Reduce Reactor Power to 90% with Recirc Flow
	■ Insert MALF-418, D, D14 Diesel Generator Trip
	■ Place D14 Inop Keylock Switch to "INOP"
	■ Remove indicating lights and hang Info Tags on D14 EDG Control and Output Breaker switches with the following: PERMIT NO.: 980000A EQUIP NAME/NUMBER: D14 Control Switch (Output Breaker Switch) REASON: Engine repairs SIGNATURE/DATE: Sign/Today's Date
	■ Ensure two (yellow) copies of ST-6-001-761-1, Main Turbine Bypass Valve Exercising, are filled out and complete to step 4.3.3. for BPV-5 is available in simulator
	■ Insert MALF-244, B, "1A" RFP High Pressure Control Valve fails closed
	■ Insert MALF-456, RCIC fails to auto start
	■ Insert MALF-174, A, "1A" RHR LPCI injection valve (1F017A) fails closed
	■ Insert MALF-183, B, "1B" Core Spray pump fails to auto start
	■ Insert MALF-20, C, 90, "1C" APRM channel fails to 90%
	■ Reset any annunciators that should not be present

B. INSTRUCTIONS FOR SIMULATOR OPERATOR

EVENT 1: MAIN TURBINE BYPASS VALVE EXERCISE TEST

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When PRO releases test PB for BPV-6, Insert MALF-108, 89, Bypass valves fail to 89% open
	■ When BPV-7 is selected, Remove MALF-108, 89, Bypass valves fail to 89% open
	■ Respond as requested to calls for support

EVENT 2: MT GLAND SEAL REGULATOR FAILS CLOSED, LOSS OF CONDENSER VACUUM, RAPID PLANT SHUTDOWN

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ After Tech Specs have been referenced, Insert MALF-69, Turbine Gland Seal Regulator fails closed
	■ If requested, after 5 minutes, Report - "1C" APRM is reading 90% in AER with no status lights lit on cabinet.
	■ When Seal Steam pressure is restored, Insert MALF-MMC074, 100% severity with a 30 minute ramp rate

EVENT 3: LOSS OF HP FEED, EMERGENCY BLOWDOWN, RPV LEVEL RESTORATION

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ 6 minutes after scram, Insert MALF-252, A, "A" FW Line rupture inside Primary Containment
	■ 3 minutes later or when "A" FW Line is isolated, Insert MALF-440, A, 1, Recirc Loop "A" rupture at 1%
	■ 10 minutes later or when Drywell Spray is initiated, Insert MALF-440, A, 8, Recirc Loop "A" rupture at 8%
	■ T-240, (8 minutes), open CRD pump discharge check valves as directed
	■ SE-10-1, (10 minutes) reset shunt trips using RF-111 through 403 on pg E4 Report - Shunt trips have been reset per SE-10-1
	■ 5 minutes after requested to open 1F017A locally, Report - 1F017A MCC contactor will not stay picked up in the open direction

Op-Test No. _____ Scenario No. A Event No.: 1

Event Description:

Perform Main Turbine Bypass Valve Exercising (ST-6-001-761-1), recognize BPV failed to open, reference Tech Specs.

Time	Position	Applicant's Actions or Behavior
	CRS	Conduct pre-evolution brief
	PRO	Verify all prerequisites are satisfied
	PRO	Notify PSD of possible transients during testing
	PRO	Obtain permission to start test
	PRO	Complete "As Found" section of Attachment 1
	PRO	Sequentially test each BPV by completing one cycle of full travel
	RO	Monitor reactor parameters during resultant reactivity transients
	PRO	Recognize BPV-3 failed to open
	PRO	Notify CRS immediately
	PRO	Enter a comment in the Additional Action/Test Comment section
	PRO	Complete testing BPV-4 through BPV-9
	CRS	Reference Tech Specs 3.7.8
	CRS	Reference Core Operating Limits Report (COLR) to determine minimum number of operable BPVs required to maintain system operability
	CRS	Request WWM support to troubleshoot and correct BPV problem

Op-Test No. _____ Scenario No. A Event No.: 2

Event Description:

Main Turbine Sealing Steam pressure regulator fails closed, OT-116 (Loss of Condenser Vacuum), RMSI, GP-4 (Rapid Plant Shutdown)

Time	Position	Applicant's Actions or Behavior
	PRO	Reference appropriate ARC's
	PRO	Monitor Main Condenser vacuum
	CRS	Monitor Turbine back pressure limits
	PRO	Open Aux. Steam header to Seal header valve HV-07-162 to restore MT Seal presssure
	CRS	Enter and execute OT-116
	RO	Continue power reduction per RMSI
	PRO	DV rod movements
	CRS	Reference GP-5 for intentional drop in power
	CRS	Contact Chemistry to consider GEZIP adjustment
	CRS	Contact PSD and inform of power drop
	RO	Recognize "1C" APRM channel not responding to power decrease
	CRS	Reference Tech Specs for failed APRM channel
	RO	Bypass "1C" APRM channel
	PRO	Dispatch operator to verify "1C" APRM reading in AER
	CRS	Contact personnel to troubleshoot "1C" APRM
	CRS	Recognize dropping vacuum can not be eliminated and direct a rapid plant shutdown per GP-4 or manually scram Reactor before Main Turbine trip
	PRO	Transfer House loads
	PRO	Reduce Recirc flow to minimum
	RO	Manually scram the Reactor
	RO	Place Mode switch in shutdown
	CRS	Enter T-101

Op-Test No. _____ Scenario No. A Event No.: 2

Event Description:

Main Turbine Sealing Steam pressure regulator fails closed, OT-116 (Loss of Condenser Vacuum), RMSI, GP-4 (Rapid Plant Shutdown)

Time	Position	Applicant's Actions or Behavior
	RO	Insert SRM's/IRM's
	PRO	Trip the Main Turbine
	PRO	Ensure Generator lockout
	PRO	Verify isolations
	RO	Recognize 'A' RFP tripped on loss of HP steam
	RO	Restore and maintain RPV level +12.5 to 54" with 'B' and/or 'C' RFP's

Op-Test No. _____ Scenario No. A Event No.: 3

Event Description:

Loss of High Pressure Feed, T-102, (Primary Containment Control), T-111 (Level Restoration), T-112 (Emergency Blowdown),

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize increasing DW pressure
	CRS	Enter OT-101
	CREW	Recognize indications of "A" FW line break
	RO	Isolate "A" FW line
	PRO	Secure Recirc pumps
	CRS	Enter and execute T-102
	PRO	Isolate HPCI
	CRS	Direct Suppression Pool Spray per T-225
	PRO	Spray the SP per T-225
	PRO	Manually start RCIC
	CRS	Direct T-240
	RO	Perform T-240
	RO	Start SLC per S48.1.B
	PRO	Close MSIVs
	CRS	Direct Drywell Spray per T-225
	PRO	Spray the DW per T-225
	CRS	Enter and Execute T-111
	PRO	Inhibit auto ADS
	CREW	Perform SE-10
	CRS	Enter and execute T-112
	PRO	Open 5 ADS/SRV's
	PRO	Manually start "1B" Core Spray pump
	PRO	Recognize "1A" RHR LPCI valve failed to open

Op-Test No. _____ Scenario No. A Event No.: 3

Event Description:

Loss of High Pressure Feed, T-102, (Primary Containment Control), T-111 (Level Restoration), T-112 (Emergency Blowdown),

Time	Position	Applicant's Actions or Behavior
	CREW	Maximize RPV injection using all available systems
	PRO	Restore and maintain RPV level above -161"
	CRS	Exit T-111 and enter T-101 when RPV level is restored above TAF

CRITICAL TASKS

1. Manually start RCIC
2. Spray the Drywell before entering the UNSAFE side of DW Spray initiation Limit Curve
3. Manually start "1B" Core Spray pump
4. Open 5 ADS/SRV's when RPV level drops below -161"
5. Inject with all available sources to restore and maintain RPV level above -161"

TERMINATION POINT

The scenario will be terminated when the following criteria are met:

1. 5 ADS/SRV's are open
2. RPV level is being maintained above -161" with LP ECCS systems

Facility: LGS Unit 1 Scenario No.: B Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Execute GP-5 (Power Operations), Reactor Maneuvering Shutdown Instructions, D13 ARC (Secure EDG), Tech Specs, S11.1.A (ESW STARTUP), OT-104 (Reactivity Insertion), OT-110 (Reactor High Level), T-103 (Secondary Containment Control), T-290 (Instrumentation for T-103), SE-8 (Fire), T-101 (RPV Control), T-117 (Level/Power Control), T-112 (Emergency Blowdown)

Initial Conditions: 100%, OPCON 1, D13 EDG Monthly Operability Test run is in progress, RCIC is blocked to fix oil leak, Equipment Operator reports increasing "0C" ESW pump packing leakage.

Turnover: Start an additional pump and shutdown "0C" ESW pump to complete D13 Test run, reduce power to 60% and remove "1A" RFP from service due to an unsat lube oil analysis.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N(PRO)	Start "0A" ESW pump
2	N/A	R(RO)	Power reduction to 60% for RFP shutdown
3	1691	I(PRO)	D13 generator neutral overcurrent
4	450	I(PRO)	HPCI inadvertent start-up
	453		HPCI Pump Discharge to FW (1F005) valve fails closed
	03,A,20		Core Power Oscillations, in phase, at 20%
	446, A 446, B	C(PRO)	HPCI Steam Isolation valves fail to close automatically or manually
5	555, 3	C(RO)	Three (3) control rods fail to scram
	24	I(RO)	Rod Drive Control System fault
6	445, 1	M(ALL)	HPCI Steam Line break inside pump room at 1%
	445, 5		HPCI Steam Line rupture in pump room escalates to 5%
	125	C(PRO)	Motor Driven Fire Pump fails to start automatically
7	445, 15		HPCI Steam Supply Line rupture escalates to 15%, steam leak spreads to Safeguard Pipeway area

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

I. SIMULATOR OPERATOR INSTRUCTIONS

A. INITIAL SIMULATOR SETUP

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	■ Perform OTM 7.1 checklist
	■ Reset simulator to IC-17
	■ Start D13 per ST-6-092-313-1, D13 Diesel Generator slow start operability test run
	■ Complete ST-6-092-313-1, yellow copy, up to, but not including step 4.10.18
	■ Remove indicating lights and ensure the following valves are closed: - RCIC Outboard Steam Supply Valve HV49-1F008 R - RCIC Steam Line Warm-up Bypass Valve HV49-1F076 - RCIC Turbine Steam Supply Isolation Valve HV49-1F045 - RCIC Trip Throttle Valve HV50-112
	■ Place INFO Tags on the above RCIC valves with the following: Permit: 980000B Equip Name/Number: (Appropriate valve number) Reason: Repair oil leak Signature/Date: Sign/Today's Date
	■ Insert MALF-446,A, HPCI Steam Isolation Valve (1F002) fails as is
	■ Insert MALF-446,B, HPCI Turbine Steam Isolation Valve (1F003) fails as is
	■ Insert MALF-555,3, Three control rods fail to scram
	■ Insert MALF-453, HPCI Pump Discharge to FW (1F005) valve fails closed
	■ Toggle RF-125, Motor Driven Fire Pump Control switch to stop, on page FP
	■ Toggle RF-396, ESW Loop 'A' Service Water isolated to yes, on page SW3
	■ Ensure A Loop ESW, SW valve position operator aid shows A loop valves closed

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	■ Ensure Spray/Bypass select switch, HSS-12-016A-1 (B, C-1, D) are positioned to Bypass
	■ Reset any alarm that should NOT be present
	■ Ensure white copy of ST-6-012-620-0, RHR spray network draining available in simulator

B. INSTRUCTIONS FOR SIMULATOR OPERATOR

EVENT 1 START "0A" ESW PUMP

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ If requested, (from Spray Pond Pump House) report - "0A" ESW pump pre-start checkout is sat
	■ If requested, after "0C" ESW S/D, report - "0C" ESW pump packing leakage has been reduced to normal running leakage. An ETT is being generated.

EVENT 2 POWER REDUCTION PER RMSI

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ 2 minutes after "0A" ESW pump has been started report - (to the CRS) this is the shift manager, you are directed to remove "1A" RFP from service. Test results on the latest lube oil sample are unsat
	■ Plant management has been informed and concur with the decision to remove "1A" RFP from service
	■ Respond by acknowledging crew callouts to: - Chemistry - PSD - RE
	■ If RE's contacted report - There are no Reactor Maneuvering Special Instructions at this time. RMSI is up to date
	■ If contacted as RFP System Manager Report - Perform power reduction directed by GP-3

EVENT 3 D13, GENERATOR NEUTRAL OVERCURRENT

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When RO has completed power reduction to 85%, Insert MALF-1691, Crywolf D13 Gen Neutral overcurrent alarm
	■ Respond as appropriate to crew requests for support

EVENT 4 HPCI INADVERTENT INJECTION

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ 4 minutes after D13 has been secured, Insert MALF-450, HPCI Inadvertent Start Insert MALF-03,A,20, Core Power Oscillations, in phase at 20% Remove MALF-03,A,20 after reactor scram
	■ Respond as appropriate to crew requests for support

EVENT 5 3 ROD ATWS, RDCS FAULT

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When RO begins driving 1st rod, Insert MALF-24, RDCS fault
	■ 5 minutes after directed to reset RDCS in AER. Remove MALF-22, RDCS fault Report - RDCS has been reset per S73.0.F

EVENT 6 HPCI STEAM LINE BREAK INSIDE PUMP ROOM PROGRESSES OVER TIME

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When all rods are in, Insert MALF-445, 1, HPCI Steam Line Break inside pump room at 1%
	■ 5 minutes later, Insert MALF-445, 5, HPCI Steam Line Break inside pump room at 5%
	■ Fire alarms Report - Fire Brigade is assembled and responding to the fire alarm code
	■ 4 minutes after dispatched to 1BC208 Report - HPCI Pump Room temperatures are ___ °F and both unit coolers are running. (160°F is top of scale)
	■ 5 minutes after directed to perform T-290 Report - HPCI Pump Room temperatures are ____ and rising. All other area temps are below MNO.
	■ 8 minutes after Fire Brigade is dispatched Report - No indication of fire in HPCI Pump room but door is hot and sounds like a steam leak inside.

EVENT 7 SECOND AREA ABOVE MSO, EMERGENCY BLOWDOWN

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When HPCI/RCIC pipeway, Room 309, Temp is 120°F Report - HPCI/RCIC pipeway, Room 309, temperature is now 120° and rising HPCI Pump Room temperature is ____°F All other T-290 room temperatures are below MNO
	■ 7 minutes later, Insert MALF-445, 15, HPCI Steam Line Break inside pump room at 15%
	■ T-290 updates (as requested) Report - Live time temperatures from RE Temps/Pressure display

Op-Test No. _____ Scenario No. B Event No.: 1

Event Description:

Start "0A" ESW Pump per S11.1.A.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct start of "0A" ESW pump
	PRO	Direct spray pond operator to perform pre-start checkout of "0A" ESW pump
	PRO	Make plant announcement prior to pump start
	PRO	Place 0AP548, ESW (pump) handswitch in start
	PRO	Obtain copy and initiate ST-6-012-620-0, RHRSW spray network draining
	PRO	Verify Service Water valves, 11-1010, 11-2010, and 11-0034A are closed
	PRO	Ensure ESW valve positions per step 4.2.6 table

Op-Test No. _____ Scenario No. B Event No.: 2

Event Description:

Power Reduction to Remove "1A" RFP from service.

Time	Position	Applicant's Actions or Behavior
	CRS	Conduct pre-evolution brief
	CRS	Reference GP-3 for guidance on BOP equipment
	CRS	Direct power reduction per RMSI, App 5, RE-C-01, to 60%
	CRS	Reference GP-5 for intentional drop in power
	RO	Reference ARCs for rod out block/RBM downscale
	CRS	Notify Chemistry personnel of power change
	CRS	Notify PSD of plans to reduce power
	PRO	Reduce Reactor Recirc pump(s) speed in small, equal increments until 90% power is reached
	PRO	Ensure FLLLP ≤1.0
	PRO	Ensure RPV core flow ≥55 Mlb/hr
	RO	Monitor RPV power, level and pressure during core flow reduction
	RO	Insert control rods per RMSI sequence to 00 position with RMCS
	PRO	DV rod moves

Op-Test No. _____ Scenario No. B Event No.: 3

Event Description:

Shutdown D13 EDG due to Generator neutral overcurrent alarm, reference Tech Spec.

Time	Position	Applicant's Actions or Behavior
	PRO	Acknowledge D13 alarm
	PRO	Reference alarm ARC
	CRS	Recognize D13 Diesel is not required for supplying D13 Bus
	CRS	Direct D13 rapid shutdown per S92.2.N
	PRO	Place D13 Diesel Generator Breaker to "Trip" and "Pull To Lock"
	PRO	Place 101-CG501/CS, D13 Diesel Generator control to "Stop" and "Pull To Lock"
	CRS	Reference Tech Spec 3.8.1.1
	CRS	Direct personnel to investigate cause of alarm

Op-Test No. _____ Scenario No. B Event No.: 4

Event Description:

HPCI Inadvertent Startup and Injection with failure to isolate, Reactor Scram enter T-101 (RPV Control)

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize HPCI start
	PRO	Recognize HPCI Pump Discharge to FW (1F005) valve failed to open
	RO	Recognize High Reactor level
	RO	Control RPV level between +12.5 and +54"
	CRS	Recognize positive reactivity addition, enter OT-104
	RO	Reduce reactor power with Recirc flow
	RO	Manually scram reactor
	CRS	Direct reactor scram
	RO	Place mode switch in shutdown
	RO	Insert SRMs and IRMs
	CRS	Determine HPCI not required for adequate core cooing and direct HPCI tripped per S55.2.A
	PRO	Attempt to isolate HPCI with manual isolation pushbutton
	PRO	Recognize and report failure of HPCI steam supply to isolate
	PRO	Verify HPCI Turbine tripped
	CRS	Direct HPCI isolation valves be closed locally

Op-Test No. _____ Scenario No. B Event No.: 5

Event Description:

Three Control Rods fail to Scram, ATWS, T-117 (Level/Power Control), Rod Drive Control System failure/reset

Time	Position	Applicant's Actions or Behavior
	RO	Recognize all rods not in
	RO	Manually insert rods with RMCS
	CRS	Verify isolations
	CRS	Direct Trip of Main Turbine
	PRO	Trip Main Turbine and report Generator lockout
	CRS	Ensure Turbine Trip and Generator lockout
	RO	Manually adjust CRD Drive water flow
	RO	Bypass RWM
	CRS	Direct T-218 for rods still out
	CRS	Exit RC/L only and enter T-117
	PRO	Inhibt Auto ADS
	RO	Reference ARC for RDCS Inoperative Alarm
	RO	Direct RDCS reset per S73.0.F
	RO	Complete inserting all control rods when RDCS is reset
	CRS	When no ATWS, exit T-117 and enter T-101 at step RC/L-1
	RO	Restore and maintain RPV level between +12.5" and +54" using Feedwater

Op-Test No. _____ Scenario No. B Event No.: 6

Event Description:

HPCI Steam Line Break Inside Pump Room progresses over time, T-103 (Secondary Containment Control)

Time	Position	Applicant's Actions or Behavior
	PRO	Acknowledge HPCI area fire alarm
	PRO	Make plant announcement dispatching Fire Brigade
	CRS	Enter and execute SE-8 (Fire)
	PRO	Reference ARC for 1BC208 HVAC panel Trouble Alarm
	PRO	Dispatch operator to 1BC208 panel
	CRS	Enter and execute T-103
	CRS	Recognize 2nd entry condition for T-103 when Div 2 Steam Leak detection alarm received
	PRO	Reference ARC for Div 2 Steam Leak detection
	CRS	Direct crew to read RPV pressure and level from PAMS, FZ, EQ PMS ONLY
	CRS	Direct performance of T-290
	CRS	Direct T-291
	CRS	Recognize HPCI pump room temperature above MNO
	PRO	Attempt to isolate HPCI per T-250
	PRO	Evacuate affected areas of Reactor Enclosure per ERP-120
	PRO	Recognize Motor Driven Fire Pump failed to start automatically and attempt to start
	CRS	Re-enter T-103 on RE Hi-Hi floor drain sump alarm condition
	CRS	Re-enter T-103 on HPCI Pump Room Flood Alarm

Op-Test No. _____ Scenario No. B Event No.: 7

Event Description:

HPCI Steam Leak Progresses to 2nd Area, T-103 (Secondary Containment Control), T-112 (Emergency Blowdown)

Time	Position	Applicant's Actions or Behavior
	CRS	Recognize from report, second area is now at MNO and rising.
	CRS	Track HPCI/RCIC pipeway, Room 309, temperature toward MSO
	CRS	Re-enter T-103 for subsequent steam leak detection alarms
	PRO	Perform T-291 for second area
	CRS	Recognize blowdown imminent per T-101, RC/P-6 and direct opening all turbine BPV.
	PRO	Use manual jack and open all turbine BPV
	CRS	Determine 2nd area temperature is above MSO
	CRS	Enter T-112
	PRO	Open 5 ADS/SRVs
	PRO	Control condensate injection to restore and maintain RPV level +12.5 to +54".

CRITICAL TASKS

1. Shutdown D13 Diesel Generator
2. Insert all control rods to or beyond 02 position
3. Open 5 ADS/SRVs when two areas in Table SCC-2 temperature exceeds MSO value

TERMINATION POINT

The scenario will be terminated when the following criteria are met:

1. All rods inserted to or beyond 02 position
2. 5 ADS/SRVs open
3. RPV level +12.5 to +54"

Facility: LGS Unit 1 Scenario No.: C Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Execute GP-5 (Power Operations), S07.6.A (Swap SJAE), Tech Specs, OT-112 (Recirculation Pump Trip), GP-5.1 (Single Loop Ops), OT-101 (High Drywell Pressure), T-101 (RPV Control), T-102 (Primary Containment Control), T-117 (Level/Power Control), T-270 (Terminate and Prevent Injection)

Initial Conditions: 65%, OPCON 1, "1B" Instrument Air compressor is blocked, Service Air is backing up "1B" I/A header, Auxiliary Steam System outage.

Turnover: Reduce Reactor Power to 60% in order to place alternate Steam Jet Air Ejector in service for planned maintenance.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R(RO)	Power reduction to 60%
2	N/A	N(PRO)	Place "B" SJAE train in service
3	442, A	C(RO)	"1A" Recirc Pump RPT breaker trip
	433, A 434, A		"1A" Recirc Pump Seals #1 and #2 fail
	441, 40		Coolant leakage in Drywell (40 gpm)
4	413	M(ALL)	ATWS, hydraulic lock
	559	C(RO)	Standby Liquid Control line ruptures inside Drywell
	251, A	I(RO)	Feedwater S/U Level Control valve fails open
	195, A 195, B	I(PRO)	RWCU Isolation valves fail to close (1F001, 1F004)
5	104, B	I(PRO)	Turbine Control System fails low (load set runs to zero)
	108, 25		EHC Bypass valves fail to 25% open
	148, D	C(PRO)	"M" ADS/SRV fails to open

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

I. SIMULATOR OPERATOR INSTRUCTIONS

A. INITIAL SIMULATOR SETUP

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	■ Perform OTM 7.1 Checklist
	■ Reset Simulator to IC-17
	■ Reduce reactor power to 65% per RMSI
	■ Ensure "A" SJAE in service with stable Cond. vacuum
	■ Place "1B" I/A compressor control switch in "OFF"
	■ Remove indicating lights and place INFO Tag on HS with the following information: Permit No.: 980000C Equip Name/Number "1B" I/A Compressor/1BK101 Reason: Motor replacement Signature/Date: Sign/Today's Date
	■ Toggle RF-201, B/U Service Air Compressor "ON", on page IA
	■ Toggle RF-202, S/A to "A" I/A cross-tie (15-1009A) closed, on page IA
	■ Toggle RF-203, S/A to "1B" I/A cross-tie (15-1009B) open, on page IA
	■ Toggle RF-5, Aux Steam available to NO on page MS1
	■ Insert MALF-424,B, "1B" I/A Compressor Trip
	■ Insert MALF-413, Control Rods fail to scram (Brown's Ferry Event)
	■ Insert MALF-559, SBLC Line Ruptures inside Drywell
	■ Insert MALF-195,A, RWCU Isolation Valve HV44-1F001, fails as is
	■ Insert MALF-195,B, RWCU Isolation Valve HV44-1F004, fails as is
	■ Insert MALF-148,D, "M" ADS/SRV fails to open
	■ Ensure APRM AGAFS on P-1 are .98-1.02
	■ Verify scram margin >9%

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	■ Ensure plant conditions are stable
	■ Reset any alarms that should not be preset.
	■ Ensure Off Gas Preheater is in service per S69.1.D

B. INSTRUCTIONS FOR SIMULATOR OPERATOR

EVENT 1 POWER REDUCTION TO 60%

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When contacted, respond as appropriate to crew communications such as: Chemistry - GEZIP adjustment PSD - Load Drop Reactor Engineer - Support

EVENT 2 PLACE ALTERNATE SJAE IN SERVICE

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When contacted as HP Report - HP Dept is aware of changing radiological conditions in Steam Jet Air Ejector rooms.
	■ 3 minutes after contacted to enable. "B" Train Steam to SJAE Cond Lo Press Alarm (immediately if pre-staged) Toggle RF-257, Select in service SJAE HSS07-165 to "B" on page MC Report HSS-007-165 on 10C680 panel in AER is now in position "B"

EVENT 3 REACTOR RECIRC PUMP TRIP, SEAL FAILURE, HIGH DRYWELL PRESSURE, GP-4

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ 1 minute after SJAE alarm swapped, Insert MALF-442,A, "1A" Recirc Pump RPT Breaker Trip Insert MALF-433,A, "1A" RRP Seal #1 Fails
	■ 5 minutes after contacted to investigate, Report "1A" Recirc Pump RPT Breaker CB3A has tripped for unknown reasons. A TRT is being developed to troubleshoot the breaker.
	■ When contacted, respond as appropriate to crew communciations.
	■ 7 minutes later, Insert MALF-434,A, "1A" RRP Seal #2 fails Insert MALF-441, 40, Coolant Leakage in drywell (40 gpm)

EVENT 4 ATWS (HYDRAULIC LOCK)

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ 1 minute after reactor scram, Insert MALF-251,A, FW Startup Level Control Valve fails open Remove MALF-441, 40, Coolant Leakage in Drywell
	■ Respond as appropriate to the following T-200 procedure callouts at the time indicated T-217 - (17 minutes), RF-192 and RF-303 on page T200 Report - SDV draining complete, levels below 62% T-209 - (45 minutes) Report - T-209 line up will take 45 minutes to complete T-221 - (11 minutes), RF-51 on pg T200 Report - T-221 (MSIVs OPEN) is complete T-270 - (7 minutes) RF-220 thru RF-227 on pg T202 Report - T-270 is complete in AER.

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ If requested to investigate SLC, Report - NO sign of leakage on 253' or 283' elev at SLC skid
	■ T-251 - (6 minutes) RF-309 on page T201 Report - T-251, HPCI to FW only is complete.

EVENT 5 TURBINE TRIP, EHC BPV FAIL, T-270

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ 5 Minutes after level is stabilized below -50", Insert MALF-104,B, EHC Load Set Runs to zero Insert MALF-108, 25, EHC BPVs fail to 25% open
	■ SE-10-1 - (10 minutes), RF-104 thru 403 on page E4 Report - Shunt Trip resets are complete per SE-10-1

Op-Test No. _____ Scenario No. C Event No.: 1

Event Description:

Intentional Power Reduction to 60% per GP-5 (Power Operations) and Reactor Maneuvering Shutdown Instructions

Time	Position	Applicant's Actions or Behavior
	CRS	Reference GP-5
	CRS	Conduct pre-evolution brief
	PRO	Notify PSD of power change
	CRS	Demand P-1 edit and verify APRM AGAF valves 0.98 to 1.02
	CRS	Verify Scram margin greater than 9.0%
	CRS	Direct power reduction to 60% using reactor maneuvering shutdown instructions
	RO	Insert control rods with RMCS as directed by RMSI
	PRO	Double verify all rod movements
	RO	Monitor power level and pressure throughout the evolution
	CRS	Monitor thermal limit/FLLLP values to verify less than 0.980 during power reduction

Op-Test No. _____ Scenario No. C Event No.: 2

Event Description:

Place "B" SJAE train in service (S07.6.A) and secure "A" SJAE train

Time	Position	Applicant's Actions or Behavior
	CRS	Conduct pre-evolution brief
	CRS	Direct swap of SJAE trains
	PRO	Review procedure
	PRO	Verify prerequisites
	PRO	Place "B" SJAE in service and shutdown "A" SJAE while maintaining condenser vacuum above 22.2" Hg. Vac.
	PRO	Monitor Main Condenser vacuum
	RO	Monitor reactor parameters

Op-Test No. _____ Scenario No. C Event No.: 3

Event Description:.

"1A' Recirc Pump Trip, OT-112 (Recirculation Pump Trip), RMSI, OT-101 (High Drywell Pressure), GP-4 (Rapid Plant Shutdown), T-101 (RPV Control), T-102 (Primary Containment Control)

Time	Position	Applicant's Actions or Behavior
	CREW	Recognize Recirc Pump trip
	CRS	Enter OT-112
	RO	Control RPV Level and restore to normal band, +12.5 to +54"
	RO	Drive rods per RMSI to reduce power to 33% RTP
	PRO	Reference appropriate ARC for Recirc Pump trip
	CRS	Determine location on Power/Flow map
	RO	Monitor for core thermal hydraulic instabilities
	PRO	DV rod movements
	CRS	Reference Tech Spec Figure 3.4.1.1-1
	CRS	Direct suction or discharge valve of tripped Recirc Pump be closed for 5 minutes.
	PRO	Close and approximately 5 minutes later, Open the "1A" Recirc Pump suction or discharge valve
	PRO	Verify "1B' Recirc Pump is operating at <90% speed
	CRS	Investigate cause of Recirc Pump Trip
	PRO	Perform S43.2.A for "1A" Recirc Pump
	CRS	Review GP-5 for power reduction
	PRO	Recognize seal failures
	PRO	Reference appropriate ARC for RRP seal failures
	CREW	Identify increasing drywell pressure
	CRS	Enter and execute OT-101
	PRO	Verify drywell cooling is maximized
	PRO	Close HV-43-1F031A, Discharge, valve for "1A" RRP

Op-Test No. _____ Scenario No. C Event No.: 3

Event Description:.

"1A' Recirc Pump Trip, OT-112 (Recirculation Pump Trip), RMSI, OT-101 (High Drywell Pressure), GP-4 (Rapid Plant Shutdown), T-101 (RPV Control), T-102 (Primary Containment Control)

Time	Position	Applicant's Actions or Behavior
	PRO	Close HV-43-1F023A, SUCTION, valve for "1A" RRP
	PRO	Close HV-46-115A, SEAL PURGE, valve
	CRS	Direct rapid plant shutdown per GP-4 before 1.68 psig in drywell
	PRO	Check Containment Leak detector, RR-26-OR600
	PRO	Check DW unit coolers condensate drain flow indicator, air cooler flow
	PRO	Transfer house loads
	RO	Manually scram reactor
	RO	Place mode switch in shutdown
	RO	Insert SRMs/IRMs
	PRO	Take manual control of HPCI
	CRS	Enter and execute T-101
	CRS	Enter and execute T-102
	PRO	Bypass and restore DW cooling per GP-8 when DW temperature exceeds 135°F
	PRO	Verify isolations

Op-Test No. _____ Scenario No. C Event No.: 4

Event Description:

ATWS (Hydraulic Lock), T-101 (RPV Control), T-117 (Level/Power Control

Time	Position	Applicant's Actions or Behavior
	CRS	Exit RC/L only and enter T-117
	RO	Manually initiate RRCS
	PRO	Runback "1B" RRP to minimum
	PRO	Trip "1B" RRP
	RO	Take manual control and open CRDH flow controller
	RO	Insert rods manually with RWM bypassed
	CRS	Direct T-217
	CRS	Direct SLC injection before SP temperature exceeds 110°F
	RO	Start all three SLC pumps
	RO	Recognize SLC pumps low discharge pressure
	RO	Secure SLC pumps to conserve SLC solution
	PRO	Recognize RWCU failed to isolate
	PRO	Isolate RWCU by closing the HV-44-1F040 valve
	PRO	Inhibit auto ADS
	CRS	Direct T-209 (SLC to RCIC)
	CRS	Direct T-221 (MSIVs open)
	CRS	Direct RPV level lowered to between -50" and -186" per T-270
	RO	Terminate FW injection until RPV level is below -50" then re-establish injection to maintain level between -50' and -129"
	CRS	Direct T-270 performed in Aux Equipment Room
	PRO	Manually isolate HPCI
	RO	Recognize LIC-06-138, Startup Bypass, is failed to 100%
	RO	Close HV-06-138A, RFP Bypass Valve

Op-Test No. _____ Scenario No. C Event No.: 5

Event Description:

Turbine Trip, T-101 (RPV Control), Control Pressure with SRVs adding heat to the Suppression Pool, "M" ADS/SRV fails to open.

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize EHC load set running back
	PRO	Recognize BPVs are not controlled reactor pressure
	CRS	Direct RPV pressure control with SRVs
	PRO	Recognize "M" SRV failed to open and open another SRV in the opening sequence
	PRO	Stabilize RPV pressure between 1096 and 900 psig
	PRO	Start RHR suppression pool cooling
	RO	Start two loops of RHRSW
	CRS	Re-enter T-102 when suppression pool temperature exceeds 95°F
	PRO	Bypass H_2/O_2 analyzers isolation logic per GP-8
	CRS	Direct T-270 when suppression pool temperature exceeds 110°F
	RO	Terminate FW and condensate injection into the RPV per T-270
	CREW	Perform SE-10 (LOCA)
	PRO	Direct SE-10-1, Shunt Trip Resets
	RO	Restart CRD pump
	PRO	Restart DWCW to drywell
	PRO	Restore H_2/O_2 analyzers
	PRO	Verify main steam line rad monitors alarms due to down scales
	PRO	Reset RHRSW rad monitors
	PRO	Restart RHRSW pumps
	RO	Stop lowering level when reactor power is below 4% or -161"
	RO	Maintain RPV level between -186 and level to which it was lowered when reactor power went below 4%.

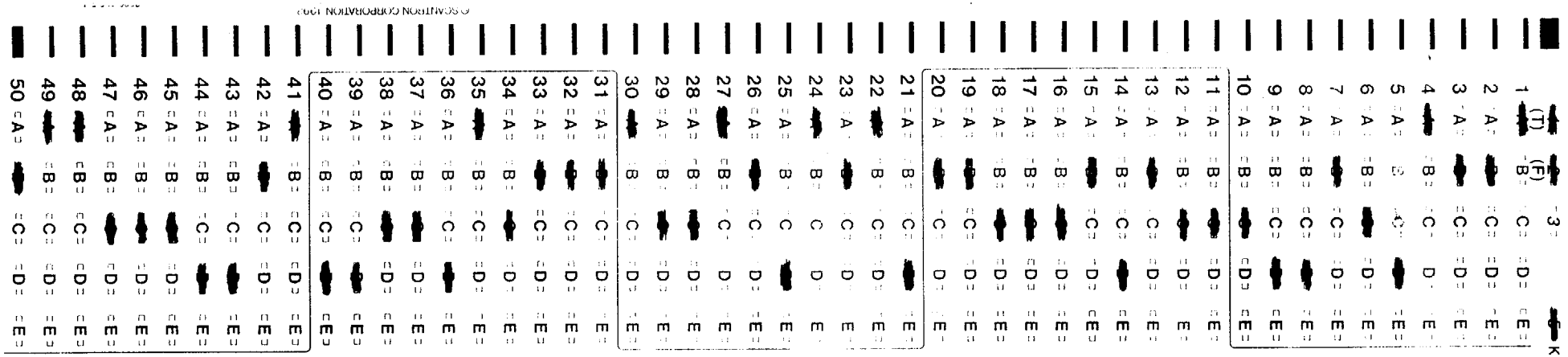
CRITICAL TASKS

1. Manually insert control rods to exit restricted region of power/flow map
2. Inhibit auto ADS
3. RPV level lowered and maintained between -186" and the level when reactor power dropped below 4%.

TERMINATION POINT

The scenario will be terminated when the following criteria are met:

1. Reactor power is less than 4%
2. RPV level being maintained between -50" and -186"



PECO NUCLEAR

STATION PB / (LGS) RO

COURSE TITLE LOT

EXAM RO

NAME _____ _____ _____
PRINT last first mi

SOCIAL SECURITY NUMBER ___ – ___ – ____

COMPANY / PECO PAYROLL # _____

DATE _____

I HAVE REVIEWED AND UNDERSTAND THE CORRECTED QUIZ; ALL WORK ON THIS EXAMINATION IS MY OWN, I HAVE NEITHER GIVEN NOR RECEIVED ASSISTANCE _____
signature

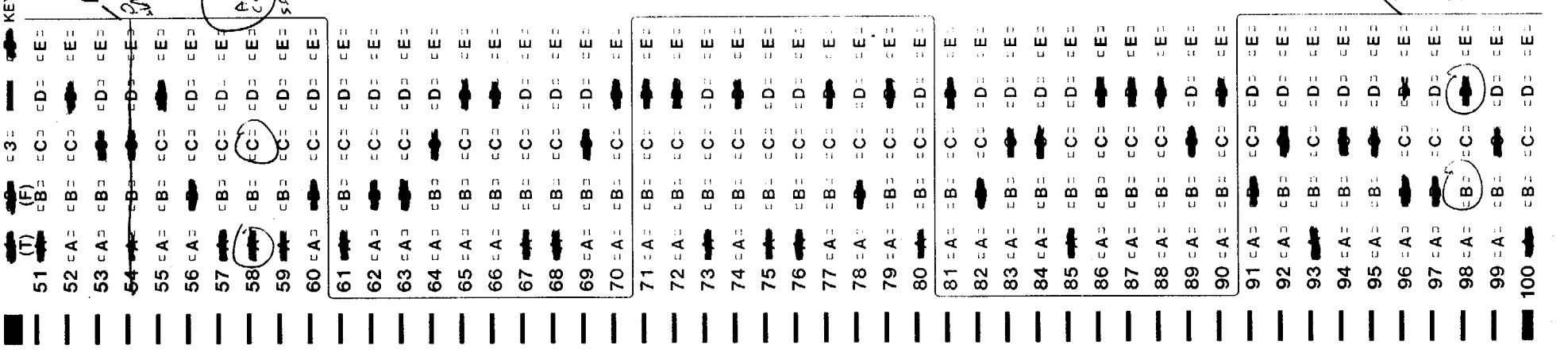
IMPORTANT

- USE #2 PENCIL
- EXAMPLE: (A) (B) ● (D) (E)
- ERASE ***COMPLETELY*** TO CHANGE

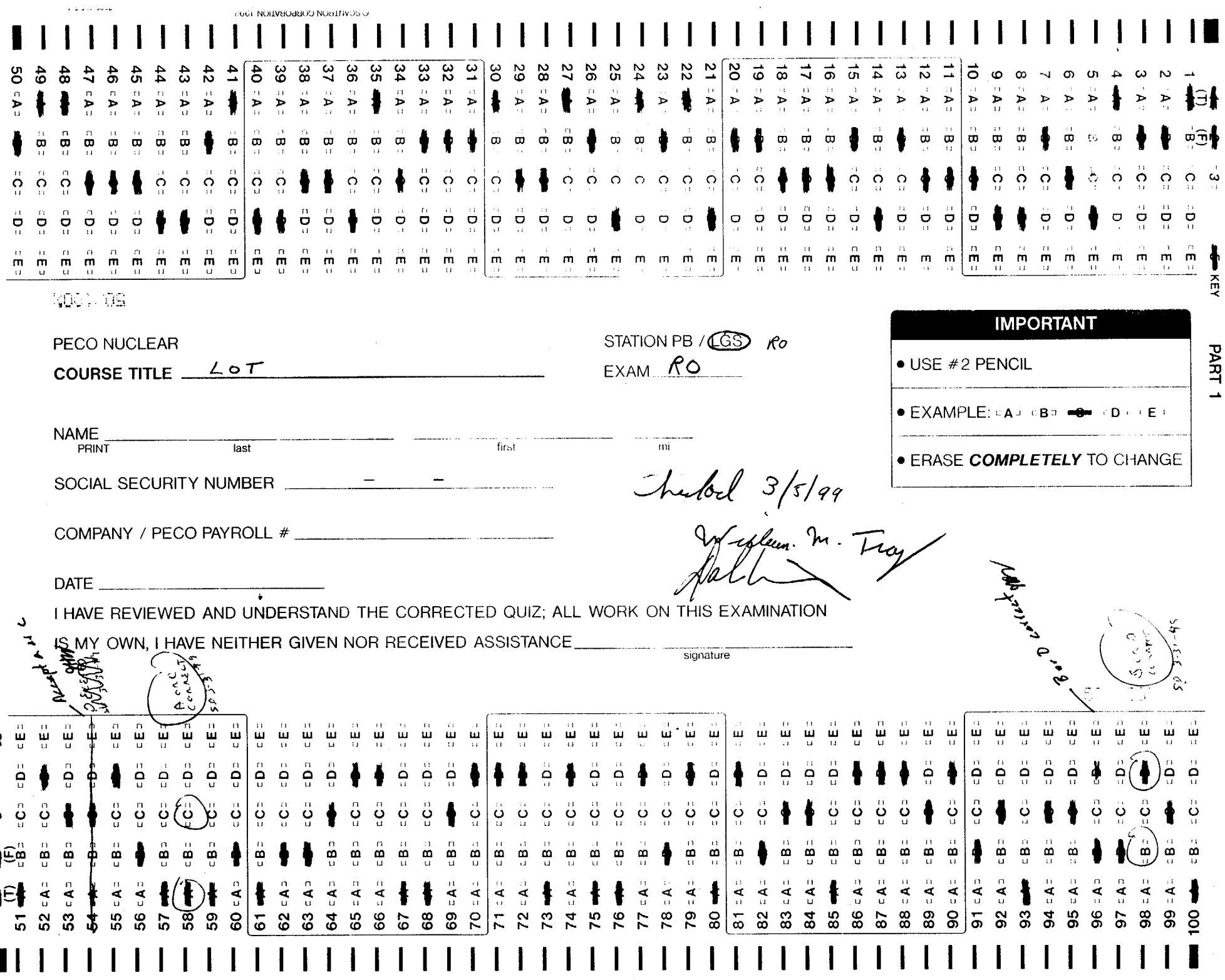
PART 1

PART 2

KEY



FEED THIS DIRECTION



PECO NUCLEAR

STATION PB / (LGS) RO

COURSE TITLE LOT

EXAM RO

NAME _____ _____ _____
PRINT last first mi

SOCIAL SECURITY NUMBER ___ – ___ – ____

COMPANY / PECO PAYROLL # _____

DATE _____

I HAVE REVIEWED AND UNDERSTAND THE CORRECTED QUIZ; ALL WORK ON THIS EXAMINATION IS MY OWN, I HAVE NEITHER GIVEN NOR RECEIVED ASSISTANCE _____
signature

IMPORTANT

- USE #2 PENCIL
- EXAMPLE: (A) (B) ● (D) (E)
- ERASE ***COMPLETELY*** TO CHANGE

PART 1

PART 2

KEY

FEED THIS DIRECTION

«« EXAM INFORMATION »»

EXAM NO.: ROWRITTEN

DATE GENERATED: 02/11/99

TOTAL POINTS: 100.00

RESPONSE TIME (min): 0.0

AVERAGE DIFFICULTY : 1.9

MULT. CHOICE	TRUE FALSE	ESSAY	FILL IN	MATCHING
QUESTIONS:100 POINTS:100.00	QUESTIONS: 0 POINTS: 0.00	QUESTIONS: 0 POINTS: 0.00	QUESTIONS: 0 POINTS: 0.00	QUESTIONS: 0 POINTS: 0.00

1) *PV:1.0

Reactor power is 32%

LT-47-*N012D SDV level transmitter fails upscale resulting in a B2 half scram.

WHICH ONE of the following describes the resulting position of the SDV vent and drain valves.

a. ALL SDV vent and drain valves open

b. ALL SDV vent and drain valves closed

c. Inboard vent and drain valves open, outboard vent and drain valves closed.

d. Outboard vent and drain valves open, inboard vent and drain valves closed.

2) PV:1.0

A total loss of Instrument Air occurs.

Plant conditions are as follows:

- All scram valves are open with reactor power at 28%
- LI-48-1R601 on 10C603 SLC tank level reads 0 inches
- "STANDBY LIQUID TANK HI/LO LEVEL" alarm annunciates
- "STANDBY LIQUID TANK LO-LO LEVEL" alarm not lit

WHICH ONE of the following describes the response of the SLC system.

a. All SLC pumps are tripped on low level and will not start

b. All SLC pumps will start 118 seconds after RRCS is initiated

c. A & B pumps will start 118 seconds after RRCS is initated. C SLC pump is tripped on low level and will not start.

d. C SLC pump will start 118 seconds after RRCS is initiated. A & B pumps are tripped on low level and will not start.

3) PV:1.0

Plant conditions are as follows:

- A loss of offsite power has occurred for both units
- D12, D14, and D21 busses are de-energized

WHICH ONE of the following describes the loops of RHR that can be placed in Suppression Pool Cooling?

a. 1A and 2A

b. 1A and 2B

c. 1B and 2A

d. 1B and 2B

4) *PV:1.0

A chemical spill results in the following indications:

"A" and "C" Toxic Gas monitors tripped

"A" and "D" Control Enclosure Chlorine monitors upscale

WHICH ONE of the following describes CREFAS status?

a. will remain in standby, no CREFAS fan running

b. will automatically initiate only "A" CREFAS, with "A" CREFAS fan running

c. will automatically initiate only "B" CREFAS, with "B" CREFAS fan running

d. will automatically initiate both "A" and "B" CREFAS, both fans running

5) PV:1.0

Plant conditions are as follows:

- Reactor Level is +35"
- DIV 3 LOCA signal (-129") was initiated 10 minutes ago due to an excess flow check valve actuation
- "C" RHR pump is in full flow test for PMT

WHICH ONE of the following would result in an automatic initiation of ADS after 105 seconds?

a. RPV level drops below +12.5"

b. "A" RHR pump is started

c. RPV level drops below +12.5" and "A" RHR pump is started

d. RPV level drops below +12.5" and "B" RHR pump is started

6) *PV:1.0

WHICH ONE of the following identifies the parameter held constant by the HPCI Flow Controller when operating in "MANUAL" mode as reactor pressure changes?

a. discharge flow

b. control valve position

c. turbine speed

d. discharge pressure

7) PV:1.0

Unit 1 plant conditions are as follows:

- D13 bus is locked out
- RPV level is -140"
- RPV pressure is 230 psig

WHICH ONE of the following describes the status of "A" Loop Core Spray?

a. Not injecting, A and C pumps running on min flow

b. Injecting approximately 3000 gpm

c. Not injecting, A and C pumps off

d. Injecting approximately 6000 gpm

8) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor Pressure 300 psig
- Reactor Level -25 inches
- Drywell Spray is in service using "1A" RHR pump
- HV51-1F017A is closed in "MANUAL OVERRIDE"

The RPV pressure input signal to 1A RHR valve logic fails to 1100 psig

WHICH ONE of the following describes the response of the 1A RHR System?

a. HV51-1F017A re-opens, "MANUAL OVERRIDE" light lit

b. HV51-1F017A re-opens, "MANUAL OVERRIDE" light out

c. HV51-1F017A remains closed, "MANUAL OVERRIDE" light lit

d. HV51-1F017A remains closed, "MANUAL OVERRIDE" light out

9) *PV:1.0

Unit 1 plant conditions are as follows:

- "DIV 1 STEAM LEAK DETECTION" alarm lit due to high temperature in RCIC room
- "DIV 3 STEAM LEAK DETECTION" alarm not lit
- "RCIC STEAM LINE HI FLOW" alarm lit due to steam flow greater than 300% of rated

WHICH ONE of the following describes the expected status of the RCIC Isolation Valves?

	HV49-1F007 (RCIC Steam Line Inboard Isolation)	HV49-1F008 (RCIC Steam Line Outboard Isolation)
a.	open	open
b.	open	closed
c.	closed	open
d.	closed	closed

10) *PV:1.0

The plant is in OPCON 2 performing startup

IRM's on range 5 reading between 40 and 60

The SRM's are being withdrawn from the core with the following readings:

SRM:	A	B	C	D
CPS:	120	86	118	109

WHICH ONE of the following describes plant status?

	SRM RETRACT PERMIT Light	ROD OUT BLOCK
a.	on	yes
b.	off	yes
c.	on	no
d.	off	no

11) PV:1.0

During steady state operation at 50% power, 8 LPRM's fail downscale.

WHICH ONE of the following describes the effect on core thermal power P-1 calculations?

a. will abort and not run

b. will indicate less than actual power

c. will indicate actual power

d. will indicate greater than actual power

12) *PV:1.0

The plant is operating at 100% power

One RWCU filter/demin is removed from service.

RWCU remains in service at the same flowrate with 2 pumps, 1 filter/ demin, and the DEMIN BYPASS (HV-44-*F044) throttled.

WHICH ONE of the following describes the trend on reactor water conductivity?

a. remain at the current value

b. drop and stabilize at a lower value

c. rise and stabilize at a higher value

d. rise continually until the second filter/demin is restored

13) *PV:1.0

Unit 2 is operating at 65% power during a power ascension.

RCIC is operating in Full Flow test for surveillance testing.

Feedwater Level Control is selected to Automatic 3-element control.

"2B" Reactor Feed Flow transmitter fails upscale.

WHICH ONE of the following is a problem associated with continued operation in this condition?

a. excessive "2A" RFP flow

b. reduced Recirc Pump NPSH

c. RFP suction header vibration

d. unplanned RCIC high level shutdown

14) *PV:1.0

The plant is operating at 95%

A leak occurs on the "A" recirc loop.

"A" recirc pump is shutdown and isolated.

Reactor level dropped to -50" and is stabilized at +30" 5 minutes later.

WHICH ONE of the following describes the status of seal purge flow to the recirc pumps?

	A Recirc Pump	B Recirc Pump
a.	in service	in service
b.	isolated	in service
c.	in service	isolated
d.	isolated	isolated

15) PV:1.0

Unit 1 was operating at 59% power when total feed flow drops to 15%.

Plant conditions are as follows:

- Reactor Power: 43%
- Recirc Speed: 28%
- Recirc Speed Demand 51%
- Feedwater restored with level stabilized at +35"
- Recirc deviation meter pegged upscale

WHICH ONE of the following describes the status of the recirc flow control system?

a. scoop tube is locked

b. runback signal is still present

c. manual controller has failed upscale

d. scoop tube positioner has failed to minimum

16) PV:1.0

The following sequence of events have occurred on Unit 2:

- A GP-4 (Rapid Plant Shutdown) was performed
- RPV water level initially dropped to -48" and has been restored to +38" and rising
- RPV pressure is 960 psig
- Drywell pressure is 0.4 psig

WHICH ONE of the following will prevent a HPCI High Level trip while maintaining HPCI automatic injection capability?

a. Depress Manual Isolation pushbutton

b. Close Steam Line Inboard Isolation valve (HV55-2F002)

c. Depress Turbine Trip while closing Steam Supply (HV55-2F001)

d. Place Flow Controller in "MANUAL" and reduce speed to 2000 rpm

17) PV:1.0

WHICH ONE of the following describes the significance of the yellow stripe on selected MCR instrumentation?

a. required by Appendix R

b. powered by Safeguard DC

c. operates in harsh environments

d. redundent indication at RSP

18) PV:1.0

WHICH ONE of the following describes the effect of a complete loss of cooling water to a control rod drive mechanism during power operation?

a. Index tube bowing

b. RPIS reed switch failures

c. Reduced life of the graphitar seals

d. Expansion of internal components causing binding

19) PV:1.0

The CRD Flow Controller (FV46-1F002B) fails open during power operation.

WHICH ONE of the following illustrates the expected change in CRDH system parameters?

	System Flow	Drive Water dp	Cooling Water dp
a.	higher	lower	higher
b.	higher	higher	higher
c.	lower	higher	lower
d.	lower	lower	lower

20) *PV:1.0

A Rod Sequence timer malfunction has occurred.

All insert signal times are increased by 8 seconds.

Rod 06-39 is at position 30.

WHICH ONE of the following describes rod 06-39 position after a single notch withdraw signal?

a. "00"

b. "02" to "28"

c. "30

d. "32" to "48"

21) *PV:1.0

Plant conditions are as follows:

- A Reactor Shutdown is in progress
- Reactor Power: 19%
- Next in-sequence rod: 18-31
- Rod 18-31 position: "12"
- Rod 18-31 target position: "08"

Rod 18-31 is Selected.

The "INSERT" Pushbutton is depressed and continously held for 30 seconds.

WHICH ONE of the following describes the status of rod 18-31?

a. settle at "10"

b. settle at "08"

c. settle at "06"

d. settle at "00"

22) *PV:1.0

** REFER TO THE ATTACHED REFERENCE **

Plant conditions are as follows:

- Generator load 1175 MWe
- Generator reactive load 225 MVAR (lagging)
- Generator H2 Gas pressure 75 psig

The PSD requests generator load be maintained at 1175 MWe.

WHICH ONE of the following states the <u>additional</u> MVAR (lagging) capacity available?

a. 220

b. 275

c. 370

d. 455

23) PV:1.0

D11 Diesel is running loaded to 2850 KW for its monthly operability ST.

Unit 1 Reactor Level drops to -150".

WHICH ONE of the following describes the status of D11 Diesel and the Diesel Output breaker?

	D11 Diesel	Diesel Output Breaker
a.	Isochronous	Closed
b.	Isochronous	Open
c.	Droop	Open
d.	Droop	Closed

24) *PV:1.0

Unit 2 ADS/SRV indication is as follows on 20C626 panel:

ADS/SRV	Red Light	Green Light	Amber Light	White Light
"2A"	ON	OFF	ON	OFF
"2H"	OFF	ON	ON	ON
"2K"	OFF	ON	OFF	OFF
"2S"	ON	OFF	ON	ON

WHICH ONE of the choices below states the ADS/SRV that is currently automatically open due to high reactor pressure?

a. "2A'

b. "2H"

c. "2K"

d. "2S"

25) PV:1.0

Unit 1 plant conditions are as follows:

- ATWS in progress
- T-270 "Terminate and Prevent" is complete
- RPV level is -190" and dropping
- Emergency blowdown is in progress
- RPV pressure is 210 psig and dropping

WHICH ONE of the following actions will initiate Core Spray injection to the reactor?

a. Open Inboard (HV52-1F005) and Outboard (HV52-1F004A) valves

b. Start "1A" Core Spray pump, open Outboard (HV52-1F004A) valve

c. Close Inboard (HV52-1F005) valve, open Outboard (HV52-1F004A), reopen Inboard (HV52-1F005) valves

d. Start "1A" Core Spray pump, close Outboard (HV52-1F004A) valve, open Inboard (HV52-1F005), reopen Outboard (HV52-1F004A) valves

26) *PV:1.0

The Drywell N_2 Purge Supply (HV-57-*21) is currently administratively blocked closed.

WHICH ONE of statements below describes the bases for this configuration?

a. nitrogen vaporizer trip due to high flow

b. pressure suppression bypass during plant fires

c. inability of valves to close against nitrogen flow during purge

d. excessive SGTS drawdown time if other unit containment isolates

27) PV:1.0

The plant is operating at 75% power when the "B" Reactor Enclosure Vent Exhaust Duct Radiation Monitor fails downscale.

WHICH ONE of the following describes the status of Reactor Enclosure Ventilation and SGTS systems?

	RE Vent	SGTS
a.	operating	standby
b.	isolated	standby
c.	operating	initiated
d.	isolated	initiated

28) *PV:1.0

Unit 2 is in OPCON 5*.

The air supply to Refuel Floor Supply to SGTS damper (HV76-019) is lost.

WHICH ONE of the following describes the status of Refuel Floor Secondary Containment?

a. will be maintained by the operating RF ventilation fans

b. cannot be maintained following RF ventilation fan trip

c. will be maintained by SGTS initiation

d. cannot be maintained following SGTS flowpath closure

29) *PV:1.0

Unit 2 is operating at 80% power with Feedwater Level Control in Automatic, 3-element control.

The "2A" RFP MGU output fails upscale.

WHICH ONE of the following describes the expected plant response?

a. Reactor level decreases, reactor scrams on low level

b. Reactor level increases, all turbines trip on high level

c. "2B" & "2C" RFP speed decreases, level stabilizes at 35"

d. "2B" & "2C" RFP speed remains constant, level stabilizes at 40"

30) PV:1.0

Unit 1 is operating at 25% power when a load reject occurs.

WHICH ONE of the following states the valves that close to prevent a turbine overspeed trip?

a. Control and Intercept

b. Bleeder Trip and Bypass

c. Main Stop and Intermediate Stop

d. #2 Main Stop and Moisture Separator Dump

31) PV:1.0

Unit 1 is in OPCON 3

Zone 1 and 3 are inter-tied for shield block removal

Unit 2 Drywell pressure increases to 2.1 psig

WHICH ONE of the choices below states the zones aligned to SGTS?

a. Zone 1 only

b. Zone 2 only

c. Zones 2 and 3 only

d. Zones 1, 2, and 3

32) PV:1.0

Unit 2 plant conditions are as follows:

- The reactor has been shutdown due to a leak in the Drywell
- Drywell Spray is required
- D21 Safeguard Bus is de-energized

WHICH ONE of the following can be used to Spray the Drywell without locally operating components?

a. "2A" RHR pump

b. "2B" RHR pump

c. Fire Water System

d. RHR Service Water System

33) *PV:1.0

Unit 1 Turbine is being removed from service due to an EHC leak. The reactor is to remain critical.

Plant conditions are as follows:

- Reactor Power is 25%
- An "A" side half scram is present
- An EO in the Aux Equipment Room reports that PIS-01-1N652D, First Stage Turbine Pressure, is in the tripped condition

WHICH ONE of the following will prevent an automatic reactor scram when the Main Turbine is tripped?

a. transfer House Loads to reset PIS-01-1N652D

b. insert control rods until PIS-01-1N652D resets

c. reduce Generator reactive load with AUTO voltage adjust until PIS-01-1N652D resets

d. open Bypass valves until "TURBINE CONTROL/STOP VALVE SCRAM BYPASSED" alarm is lit

34) *PV:1.0

Plant conditions are as follows:

- Two in-series downcomer vacuum breakers are stuck open
- A LOCA occurs in the Drywell
- Drywell pressure stabilizes at 23 psig
- Suppression Pool level is 23.5 ft

WHICH ONE of the following indicates final Suppression Pool pressure?

a. 10 psig

b. 18 psig

c. 23 psig

d. 28 psig

35) PV:1.0

Plant conditions are as follows:

- Main Turbine tripped from 100% power
- 40 control rods failed to fully scram due to hydraulic lock
- Reactor Power is 5%
- Reactor Mode Switch is in "SHUTDOWN"
- CRD drive water pressure is 260 psid

WHICH ONE of the following describes why the RO cannot manually insert control rods?

a. RWM rod block

b. APRM rod block

c. Low CRD drive water pressure

d. Full Scram Discharge Volume

36) PV:1.0

Both Units are in OPCON 2

A loss of Offsite power occurs

WHICH ONE of the following describes the cooling water alignment for the Diesel Generators?

	Source	Return
a.	Cooling Tower	Cooling Tower
b.	Spray Pond	Cooling Tower
c.	Cooling Tower	Spray Pond
d.	Spray Pond	Spray Pond

37) *PV:1.0

A loss of all AC power occurs

E-1 directs Natural Ventilation to be established for HPCI and RCIC

WHICH ONE of the following describes why this action must be taken?

a. Service Water flow is lost

b. Reactor Enclosure Ventilation fans are off

c. HPCI and RCIC room unit coolers are de-energized

d. Steam Leak Detection temperature isolations occur

38) *PV:1.0

WHICH ONE of the following is an Immediate Operator Action for reactor high pressure?

a. lower Load Set

b. raise Load Limit

c. lower Pressure Set

d. raise Maximum Combined Flow

39) *PV:1.0

Unit 2 is operating at 100% power.

A Feedwater Level transmitter failure causes reactor level to drop to -5" for several seconds.

Reactor Power is 37%.

WHICH ONE of the following will allow control of RPV level using the Feedwater Master Controller?

a. "AUTO" mode with thumbwheel setpoint

b. "AUTO" mode with "OPEN" and "CLOSE" pushbuttons

c. "MANUAL" mode with thumbwheel setpoint

d. "MANUAL" mode with "OPEN" and "CLOSE" pushbuttons

40) PV:1.0

Unit 1 is in OPCON 5

- Suppression Pool Cooling is in service using the cross-tie and the "1C" RHR pump
- DIV 3 LOCA signal occurs

WHICH ONE of the following describes the resulting valve alignment for HV51-1F048A (Heat Exchanger Bypass) and HV51-1F017C ("C" LPCI Injection) valves?

	HV51-1F048A	HV51-1F017C
a.	open	open
b.	open	close
c.	close	close
d.	close	open

41) *PV:1.0

Unit 2 is at 90% power

- "LOSS OF SQUIB VALVE CONTINUITY" alarm annunciates
- Reactor power is lowering
- RWCU isolates

WHICH ONE of the following states required action and bases?

a. Scram the reactor due to uncontrolled reactivity insertion

b. Scram the reactor due to possible thermal limit violations

c. Secure SLC pumps due to regional power oscillations

d. Secure SLC pumps due to reactor coolant high conductivity

42) *PV:1.0

All Remote Transfer Switches are placed to "REMOTE" at the Unit 1 Remote Shutdown Panel.

WHICH ONE of the following describes the status of "RCIC STEAM LINE OUTBOARD ISOLATION" (HV-49-1F008) valve?

	MCR Control	Component Interlocks	Control Power
a.	Enabled	Active	Normal
b.	Disabled	Bypassed	Alternate
c.	Enabled	Bypassed	Alternate
d.	Disabled	Active	Normal

43) *PV:1.0

Plant conditions are as follows:

- Unit 1 is in OPCON 5
- Reactor cavity is flooded with spent fuel pool gates removed
- Both Reactor Well Top and Bottom seals, #3 and #4, have failed
- A Site Area Emergency has been declared due to offsite release

WHICH ONE of the following actions is required?

a. Enter and execute T-101

b. Enter and execute T-102

c. Enter and execute T-103

d. Enter and execute T-104

44) *PV:1.0

Unit 1 is in OPCON 5*

Unit 2 is in OPCON 1 with Drywell N_2 makeup in progress

A fuel bundle drops in the Unit 1 Spent Fuel Pool

Refuel Floor Exhaust Radiation levels increase to 5 mr/hr

WHICH ONE of the following states plant response?

	Unit 2 N_2 Makeup	RF Ventilation	SGTS
a.	aligned	in service	in standby
b.	isolated	in service	running
c.	aligned	isolated	in standby
d.	isolated	isolated	running

45) *PV:1.0

Plant conditions are as follows:

- Drywell Pressure: 24 psig
- Drywell Temperature: 250°F
- Suppression Pool level: 39.2 ft

WHICH ONE of the following bases states why Drywell Spray is prohibited?

a. excessive stress on SRV tailpipes

b. excessive Suppression Pool wall loading

c. excessive Suppression Pool to Drywell differential pressure

d. excessive pressure drop due to evaporative cooling

46) *PV:1.0

Plant conditions are as follows:

- Reactor is shutdown
- Suppression Pool level is 16.9 ft
- RCIC is injecting to the RPV, suction temp 106°F
- A RHR is in Suppression Pool Cooling, suction temp 115°F
- B RHR is secured, suction temp 97°F
- SPOTMOS indicated temp 128°F
- CST level is 33.5 ft.

WHICH ONE of the following describes the valid Suppression Pool temperature?

a. 97°F

b. 106°F

c. 115°F

d. 128°F

47) *PV:1.0

Plant conditions are as follows:

- Drywell temperature: 200°F
- Drywell Pressure: 23 psig
- Suppression Pool Pressure: 22.5 psig
- Suppression Pool Level: 13.1 ft
- Suppression Pool Water Temperature: 98°F

WHICH ONE of the following actions will allow use of RHR for Suppression Pool Spray?

a. vent the Drywell

b. vent the Suppression Pool

c. raise Suppression Pool level

d. reduce Suppression Pool temperature

48) *PV:1.0

Steam cooling is in progress per T-111, with the following conditions:

- RPV level is -196"
- No injection into the RPV

WHICH ONE of the following describes the status of the fuel?

	Adequate Core Cooling	Expected Peak Clad Temp
a.	yes	1800°F
b.	yes	2200°F
c.	no	1800°F
d.	no	2200°F

49) *PV:1.0

Plant conditions are as follows:

- An ATWS is in progress
- Plant Monitoring System (PMS) is inoperable

WHICH ONE of the following can be used to confirm that a control rod is fully inserted?

a. Green "IN" light is lit on the Full Core Display

b. Blue "SCRAM" light is lit on the Full Core Display

c. "- -" (two dashed lines) on the Four Rod Display

d. "X X" (two X's) on the Four Rod Display

50) *PV:1.0

Plant conditions are as follows:

- A South Vent Stack radiation release is in progress
- Unit 1 Containment Purge with air is in progress
- SGD-206-3 (Refuel Floor to SGTS connecting damper) is closed

WHICH ONE of the following describes the source of the rad release?

a. Unit 1 TEECE

b. Unit 1 REECE

c. Off-gas System

d. Unit 1 Containment Purge

51) *PV:1.0

Plant conditions are as follows:

- A LOCA is in progress
- Drywell H_2 - 3%
- Drywell O_2 - 8%
- Suppression Pool H_2 - 7%
- Suppression Pool O_2 - 4%

WHICH ONE of the following describes the T-102 Sheet 2 sections required to be performed?

a. DW/G-3 and SP/G-1

b. DW/G-2 and SP/G-2

c. DW/G-3 and SP/G-3

d. DW/G-2 and SP/G-1

52) *PV:1.0

Unit 2 is operating at 75% power

The "2B" steam pressure transmitter for EHC fails upscale

Reactor Mode Switch is placed in "SHUTDOWN"

Reactor pressure is 850 psig and lowering

WHICH ONE of the actions below will terminate this plant transient?

a. raise PRESSURE SET

b. lower BYPASS JACK

c. raise LOAD LIMIT

d. lower MAXIMUM COMBINED FLOW

53) *PV:1.0

Unit 1 is operating at 60% power

The "1C" RFP trips while being placed in service

The "1C" Low Pressure Heater string isolates

FLLLP is 1.104 and slowly rising

WHICH ONE of the following describes the effect on Thermal Power and reason for this trend?

a. rising due to rising Reactor Pressure

b. dropping due to lowering Reactor Level

c. rising due to loss of feedwater heating

d. dropping due to loss of feedwater flow

54) *PV:1.0

Unit 2 Remote Shutdown Panel is manned due to a fire in the MCR.

- Drywell Pressure: 2.5 psig
- DIV 3 DC power lost

WHICH ONE of the following states available pressure control?

a. "2A", "2C", or "2N" SRV

b. "2S", "2M", or "2K" SRV

c. "2A", "2C", or "2N" SRV only after Instrument Air backup

d. "2S", "2M", or "2K" SRV only after Instrument Air backup

55) *PV:1.0

** REFER TO THE ATTACHED REFERENCE **

Unit 1 plant conditions are as follows:

- Reactor Power: 70%
- LP Turbine Inlet Pressure: 84 psig
- Condenser Vacuum: 23.9" Hg

WHICH ONE of the following states action required?

a. raise recirc flow

b. raise "PRESSURE SET"

c. place the standby SJAE in service

d. trip the turbine within 5 minutes

56) *PV:1.0

Unit 1 DIV IV DC is deenergized.

E-1FD directs initiation of a Manual MCR Chlorine Isolation.

WHICH ONE of the following describes why the manual isolation is initiated?

a. minimizes heat load on CEHVAC System

b. ensures outside air is isolated to the MCR

c. prevents excessive positive MCR pressure

d. places MCR on recirc to ensure panel cooling

57) *PV:1.0

The following conditions exist:

- Unit 1 is at 100% power
- "1D" Narrow Range Level Transmitter is upscale

"1C" Feedwater Narrow Range Level Transmitter fails upscale.

WHICH ONE of the following states the status of the Reactor Feedpump Turbines and the Main Turbine?

	RFP Turbines	Main Turbine
a.	operating	operating
b.	tripped	tripped
c.	tripped	operating
d.	operating	tripped

58) *PV:1.0

Reactor Recirc pumps are required to be tripped during a loss of Instrument Air.

WHICH ONE of the following states the basis for this action?

a. loss of Recirc M-G set winding cooling

b. loss of Recirc M-G set oil cooling

c. loss of Recirc pump seal cooling

d. loss of Recirc pump oil cooling

59) *PV:1.0

Following a LOCA, the HV-C-01-1F020 (Main Steam Line Equalizer Valve) is closed and cannot be opened.

All MSIV's are closed.

WHICH ONE of the following describes how leakage past the MSIV seats is controlled?

a. directed to the Main Condenser via Main Stop Valve Above Seat Drain lines

b. directed to the Main Condenser via Hotwell Heating Coils

c. directed to the Reactor Enclosure via Main Steam Line Barrier Vent valves

d. directed to the Reactor Enclosure via "1C" Main Steam Line Vent

60) *PV:1.0

Unit 2 plant conditions are as follows:

- "2B" RHR operating in Shutdown Cooling in OPCON 4
- "2B" Reactor Recirc Pump SUCTION and DISCHARGE valves (HV43-2F023 and 2F031) are OPEN.
- Reactor Pressure: 25 psig
- "2B" RHR Suction Temperature: 120°F
- "2B" RHR Flow: 6200 gpm
- Reactor Level: +54"

WHICH ONE of the following reflects plant status?

	Shutdown Cooling Flow	Reactor Water Temperature
a.	thru core	120°F
b.	bypassing core	greater than 120°F
c.	thru core	greater than 120°F
d.	bypassing core	120°F

61) *PV:1.0

Plant conditions are as follows:

- RPV Pressure: 50 psig
- Drywell Pressure: 30 psig
- Drywell Temperature: 350°F
- Suppression pool level: 20.6 ft

Reactor Level indications:

- Wide Range: -70"
- Shutdown Range: +80"
- Upset Range: +60"
- Narrow Range: +10"
- Fuel Zone: Upscale

WHICH ONE of the following describes Reactor water level?

a. unknown

b. -60" to -80"

c. +0" to +20"

d. +70" to +90"

62) *PV:1.0

WHICH ONE of the following describes the basis for maximum Containment water level of 115.8 ft?

a. Drywell pressure tap becomes covered with water

b. Drywell Purge Exhaust line fills with water

c. Drywell Spray headers become covered with water

d. Drywell equipment hatch seal failure

63) *PV:1.0

Unit 1 is operating at 35%

TIP operations are in progress

Reactor water level drops to -75".

"REACTOR ENCLOSURE AREA HI RADIATION" Annunciates.

An EO reports "NEUTRON MONITORING SYSTEM AREA" ARM is alarming.

WHICH ONE of the following describes the status and cause of this MCR alarm?

a. expected, as TIP withdraws and stops at the indexer

b. expected, as TIP withdraws and stops at the shield

c. not expected, as TIP withdraws and stops at the indexer

d. not expected, as TIP withdraws and stops at the shield

64) *PV:1.0

Plant conditions are as follows:

- RWCU resin spill has occurred in the Reactor Enclosure
- Reactor Enclosure HVAC Exhaust rad level is 8.7 mr/hr
- T-290 readings above MNO as follows:
  RWCU "A" pump room 121 mr/hr
  RWCU regen Htx room 102 mr/hr

Access to the Reactor Enclosure is required.

WHICH ONE of the following actions is required?

a. isolate Refuel Floor HVAC

b. restore Reactor Enclosure HVAC

c. ensure Standby Gas Treatment System running

d. manually scram the reactor at 50% core flow

65) *PV:1.0

Unit 2 Reactor Power is 3%

"2A" Recirc Pump trips

WHICH ONE of the choices below states required Immediate Operator Action(s)?

a. SCRAM the Reactor and PLACE mode switch in "SHUTDOWN"

b. Drive rods to exit the Restricted Area of Power/Flow Map

c. Close "DISCHARGE" Valve (HV43-2F031A) for tripped Recirc Pump

d. MONITOR and CONTROL Reactor Level until normal level restored

66) *PV:1.0

Refueling activities are in progress on Unit 1.

All control rods are fully inserted.

A fuel bundle is being moved from the Spent Fuel Pool to the Core.

WHICH ONE of the following conditions is required if the Refuel Bridge is to enter the fuel transfer/cattle chute area at normal speed?

a. Auxiliary Hoists are not loaded

b. Boundary Zone Computer in "Bypass"

c. Reactor Mode Switch in "SHUTDOWN"

d. Grapple at the normal full up position

67) *PV:1.0

Plant conditions are as follows:

- Unit 1 is at 3% power
- Mechanical Vacuum Pump operating
- All MSIVs and Main Steam Line Drain valves open

"1A" and "1B" Main Steam Line Radiation Monitors both trip (>3xNFPB)

WHICH ONE of the following describes plant status?

	MSIVs	Steam Line Drains	Mechanical Vacuum Pump
a.	open	open	tripped
b.	isolated	open	running
c.	open	isolated	running
d.	isolated	isolated	tripped

68) *PV:1.0

Reactor power is 20%

Control Rod 28-29 is selected

WHICH ONE of the following describes Rod Block Monitor (RBM) status?

a. bypassed, will not enforce a rod block

b. bypassed, will enforce a rod block at 107%

c. enforcing, will enforce a rod block at 112%

d. enforcing, will enforce a rod block at 117%

69) *PV:1.0

Plant conditions are as follows:

- In OPCON 5
- Reactor Cavity is flooded
- Spent Fuel Pool gates are removed
- Reactor Cavity Water Level begins to drop
- Spent Fuel Pool makeup cannot stabilize Reactor Cavity Water Level

WHICH ONE of the following describes the long term effects?

	Fuel Pool Cooling Pumps	Fuel In Spent Fuel Pool
a.	tripped	uncovered
b.	running	uncovered
c.	tripped	covered
d.	running	covered

70) *PV:1.0

The following parameters are reported for Unit 1:

- HPCI Pump Room: 160°F
- RCIC Pump Room: 100°F
- "1A" & "1C" RHR Pump Room: 150°F
- HPCI Room Water Level: 8"
- All other T-290, "Instrumentation Available For T-103", parameters are normal

WHICH ONE of the following systems are no longer assured to be available for safe shutdown of the plant?

a. HPCI

b. RCIC

c. HPCI and RCIC

d. "1A" & "1C" RHR pumps

71) *PV:1.0

The Unit 2 RO is requested to support a PMT which requires data collection from the Containment Hydrogen Recombiner panel 2AC696.

The data will take 20 minutes to obtain.

WHICH ONE of the following describes the necessary steps for the RO to obtain the data?

a. notify the PRO, short term relief is not required

b. obtain CRS authorization, short term relief is not required

c. short term relief is required, no log entry is required

d. short term relief is required, log entry is required

72) *PV:1.0

The Unit is in OPCON 1

Manual Scoop Tube operation is required at the M-G set

The Floor Supervisor is standing by at the M-G set to provide needed support

WHICH ONE of the individuals below is permitted to manipulate the Scoop Tube?

a. Duty Reactor Engineer

b. Turbine Enclosure EO (nonlicensed)

c. Engineer in current SRO Certification class

d. EO in current RO licensing class

73) *PV:1.0

ST-6-092-364-1, D14 DIESEL GENERATOR OPERABILITY VERIFICATION, is in progress.

The EO working locally at the EDG reports that the procedure directs operation of LOCAL-REMOTE SELECTOR SWITCH "43-DG207".

The EO verifies that this switch number should be "43-DG501".

WHICH ONE of the following describes the actions necessary to complete this ST?

a. stop, submit a TC for the change and then continue

b. stop, submit a PPIS for the change and then continue

c. complete the ST, then submit a TC for the change

d. complete the ST, then submit a PPIS for the change

74) *PV:1.0

Clearance removal is being evaluated for Independent and Double Verification requirements?

Verification of several steps in the clearance will require exposure of 12 to 15 mR.

WHICH ONE of the following reflects verification requirements?

	Independent Verifications	Double Verifications
a.	can be waived	can not be waived
b.	can not be waived	can be waived
c.	can not be waived	can not be waived
d.	can be waived	can be waived

75) *PV:1.0

Plant conditions are as follows:

- An ATWS is in progress
- T-101, RPV CONTROL, and T-117, POWER/LEVEL CONTROL, are being implemented
- SAMP procedure entry is now required

WHICH ONE of the following states the procedures which are required to be implemented?

a. SAMPs only

b. SAMPs and T-101

c. SAMPs and T-117

d. SAMPs, T-101 and T-117

76) *PV:1.0

Plant conditions are as follows:

- Reactor power is 7%
- Mode Switch is in "RUN"
- All IRMs are fully inserted
- "E" APRM is downscale reading 2%
- "B" APRM is INOP
- "G" IRM is INOP

WHICH ONE of the following describes how RPS will respond?

a. full scram

b. remains energized

c. only "A" side half scram

d. only "B" side half scram

77) *PV:1.0

All Non-Safeguard DC power is lost.

WHICH ONE of the following describes the operation of the 13.2 kV Aux Buses?

a. auto transfers to offsite source when main turbine trips

b. can be manually transferred to offsite source from MCR

c. auto transfers when 13.2 kV bus voltage drops to 90%

d. bus voltage drops to zero as the turbine slows

78) *PV:1.0

SRVs are automatically cycling open and closed due to high Reactor pressure.

WHICH ONE of the following describes the reason SRVs should be opened manually to reduce Reactor pressure to 990 psig?

a. prevents excessive inventory loss

b. minimizes the potential of an SRV sticking open

c. minimizes SRV accumulator inventory loss

d. minimizes potential for a stuck open Downcomer Vacuum Breaker

79) *PV:1.0

Plant conditions are as follows:

- Drywell Pressure: 2.5 psig
- Reactor Pressure: 600 psig
- H2O2 Analyzers are bypassed and returned to service
- Reactor level subsequently drops to -135"

WHICH ONE of the following describes why the H2O2 Analyzer sample valves have re-closed?

a. bypass logic malfunction

b. second isolation signal received

c. loss of Instrument Air pressure

d. loss of power to the valve logic

80) *PV:1.0

Plant conditions are as follows:

- Unit 1 is in OPCON 2
- Reactor Pressure: 300 psig
- Feedwater is aligned for Startup Level Control, RFP Discharge Valves are closed
- A loss of Instrument Air occurs, both headers indicate 0 psig

WHICH ONE of the following describes Feedwater makeup capability?

a. not available

b. available with "1A" RFP

c. available with LIC-06-138 (STARTUP BYPASS)

d. available with LIC-06-120 (RFP BYPASS CONTROLLER)

81) *PV:1.0

All four (4) POST LOCA RAD MONITORS trip.

WHICH ONE of the choices below reflects the status of Reactor Enclosure sumps?

	Floor Drain	Equipment Drain
a.	aligned to Radwaste	aligned to Radwaste
b.	pumps tripped	aligned to Radwaste
c.	aligned to Radwaste	pumps tripped
d.	pumps tripped	pumps tripped

82) *PV:1.0

A TIP is stuck in the core during an accident.

WHICH ONE of the following will isolate the TIP penetration?

a. place Drive Control Unit power switch to "OFF"

b. place Explosive Shear Valve keylock to "FIRE"

c. remove control power fuse from front of Drive Control Unit

d. place Drive Control Unit Ball Valve control switch to "CLOSED"

83) *PV:1.0

Unit 2 is in OPCON 4.

"2B" RHR Loop in Shutdown Cooling.

A Div II High Drywell Pressure signal is initiated.

WHICH ONE of the following describes the status of "2B" RHR Loop?

	LPCI Injection Valve (2F017B)	Shutdown Cooling Return Valve (2F015B)
a.	open	closed
b.	closed	closed
c.	open	open
d.	closed	open

84) *PV:1.0

CARDOX has been manually initiated for CABLE SPREAD ROOM

Workers are still in the Inverter Room

WHICH ONE of the following describes the action required to terminate CARDOX operation?

a. set pneumatic discharge timer to zero

b. isolate CO_2 line in Cable Spread Room

c. select "ABORT" on panel outside Cable Spread Room

d. isolate CO_2 tank located on Turbine Enclosure 217'elevation

85) *PV:1.0

Plant conditions are as follows:

- Unit 1 is in OPCON 1
- Hotwell Level: 45"
- CST Level: 28.5'

WHICH ONE of the following adjustments to the Hotwell Level Controllers will add inventory to the CST?

a. select "MANUAL" and adjust output to "REJECT"

b. select "MANUAL" and adjust output to zero

c. select "MANUAL" and adjust output to "MAKEUP"

d. select "AUTO" and adjust setpoint ribbon to 50"

86) *PV:1.0

Plant conditions are as follows:

- Both units are at 8% power
- Both turbines are at 1800 rpm

WHICH ONE of the following describes the results of Turbine Exhaust Hood Temperature reaching 230°F on both Units?

	Unit 1 Turbine	Unit 2 Turbine
a.	Tripped	Tripped
b.	On-line	On-line
c.	Tripped	On-line
d.	On-line	Tripped

87) *PV:1.0

Unit 2 has sustained combustion in the Offgas System.

HWC System is in operation.

WHICH ONE of the following will immediately terminate O_2 Injection Flow?

a. manually closing SJAE first stage steam valves

b. manually closing SJAE second stage steam valves

c. depressing HWC SHUTDOWN SWITCH for 2 seconds

d. depressing HWC SHUTDOWN SWITCH for 17 seconds

88) *PV:1.0

Unit 1 plant conditions are as follows:

- A LOCA signal is present
- "1A" RHR is in Suppression Pool Spray
- Drywell Pressure has been lowered to 1.2 psig

The LOCA signal is reset

WHICH ONE of the following describes the status of a "1A" RHR?

	Full Flow Test HV51-1F024A	Pool Spray HV51-1F027A
a.	Closed	Closed
b.	Open	Closed
c.	Closed	Open
d.	Open	Open

89) *PV:1.0

Plant conditions are as follows:

- Unit 2 experienced a loss of offsite power 10 minutes ago
- D22 and D24 diesels failed to start
- Reactor Power: 9%
- Reactor Pressure: 1160 psig

WHICH ONE of the following describes the status of Unit 2 SLC System?

	SLC Pumps	SLC Squib Valves
a.	not running	not fired
b.	A and B running	A and B fired
c.	A and C running	A and C fired
d.	A,B, and C running	A,B,and C fired

90) *PV:1.0

Plant conditions are as follows:

- RCIC is running aligned to the CST
- Suppression Pool Level is 17 feet and rising

CST level is dropping.

WHICH ONE of the following describes when RCIC suction will automatically align to the Suppression Pool?

a. 22 feet in Suppression Pool

b. 24.2 feet in Suppression Pool

c. 29 feet in CST

d. 2.3 feet in CST

91) *PV:1.0

Unit 1 is at 40% power

- "1A" and "1B" RFP's in service
- "1C" RFP is secured
- Reactor Level Control is in automatic, 3-element control.

The "1B" RFP Low Pressure Main Stop Valve fails closed.

WHICH ONE of the following describes plant status five (5) minutes later?

	1B RFP	Reactor Water Level
a.	feeding	lowering
b.	feeding	normal
c.	not feeding	lowering
d.	not feeding	normal

92) *PV:1.0

The plant is in OPCON 2 with the following IRM indications:

IRM	RANGE	READING
A	6	79
B	6	83
C	6	123
D	6	Bypassed
E	6	97
F	6	122
G	6	81
H	6	103

WHICH ONE of the following actions are required?

a. Bypass C IRM

b. Perform a GP-4 shutdown

c. Immediately scram the reactor

d. Position all IRMs to range 7

93) *PV:1.0

Unit 2 has scrammed due to a Main Turbine high water level trip.

WHICH ONE of the following communications from the RO to the CRS requires a repeat back?

a. "securing the CRD pump"

b. "inserting SRMs and IRMs"

c. "placing the Mode Switch in Shutdown"

d. "House Loads have transferred"

94) *PV:1.0

I&C testing is being performed

Main Steam Line Flow High channel B calibration functional (ST-2-041-425-2) is in progress.

Expected alarm "MAIN STEAM LINE HI FLOW" annunciates.

WHICH ONE of the following describes required MCR alarm response to this testing?

a. only the unit RO is permitted to acknowledge this alarm

b. only the PRO is permitted to acknowledge this alarm

c. I&C is permitted to acknowledge this alarm with RO concurrence

d. I&C is permitted to acknowledge this alarm without RO concurrence.

95) *PV:1.0

WHICH ONE of the following describes appropriate use of an Information Tag?

a. on the HPCI Auxiliary Steam manual supply valve during a HPCI block

b. on a Service Water motor operated valve feeder breaker during adjustment to valve packing

c. on a CRD HCU manual valve that is to be replaced during a CRD block

d. on a Feedwater Heater Level Controller Drain valve operated in "MANUAL" during troubleshooting under TRT

96) *PV:1.0

Unit 1 is in OPCON 5 with Core Alterations in progress.

The Refuel Bridge has lost communication with the RO while removing a bundle from the core.

WHICH ONE of the following describes the status of core alterations?

a. may continue at the discretion of the Fuel Handling Director

b. must be suspended after the bundle is placed in a safe location

c. may continue if the RO monitors fuel movements via the Refuel Floor video equipment

d. must be suspended immediately and the bundle must not be raised or lowered.

97) *PV:1.0

An individual has 3200 mR TEDE annual exposure.

This worker is required to perform an evolution with an exposure estimate of 400 mR.

WHICH ONE of the following describes the appropriate dose controls?

a. no Dose Extension is required

b. Admin Dose Extension is required

c. Planned Special Exposure is required

d. no further exposure is permitted

98) *PV:1.0

After exiting a posted Contaminated Area, you perform a whole body frisk.

- Background Readings are 350 cpm
- Highest reading during whole frisk 470 cpm

WHICH ONE of the following describes action to be taken?

a. continue with assigned work

b. reperform frisk, if readings are unchanged, contact HP

c. change scrubs, reperform frisk, if readings remain unchanged continue work

d. move to an area of lower background, taking measures to contain any contamination, reperform frisk

99) *PV:1.0

T-200, Primary Containment Emergency Vent Procedure, requires closing Steam Flooding Dampers when preparing to vent through the 24" Suppression Pool Purge Supply Line.

WHICH ONE of the following describes the method and reason for accomplishing this?

a. place steam flooding damper keylock switches to test; prevents duct work rupture

b. initiate a reactor enclosure HVAC isolation from the MCR; prevents duct work rupture

c. place steam flooding damper keylock switches to test; minimizes steam flooding in critical areas

d. initiate a reactor enclosure HVAC isolation from the MCR; minimizes steam flooding in critical areas

100) *PV:1.0

A Site Area Emergency has been declared.

All required Emergency Response Facilities have been activated.

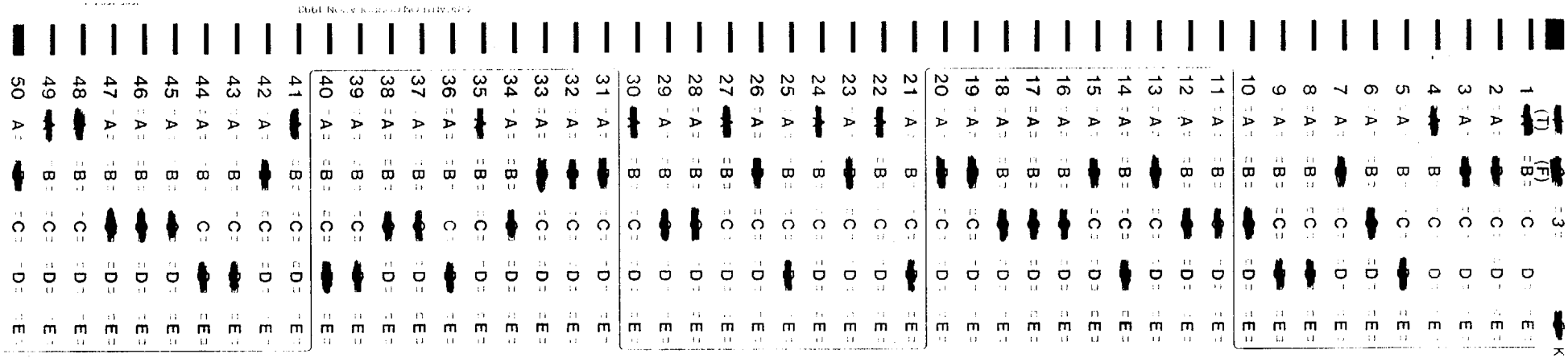
WHICH ONE of the following describes where Equipment Operators will assemble?

a. OSC

b. FOF

c. EFDC

d. TSC



PECO NUCLEAR

STATION PB / (LGS)

COURSE TITLE LOT

EXAM SRO

IMPORTANT
• USE #2 PENCIL
• EXAMPLE: A B ● D E
• ERASE ***COMPLETELY*** TO CHANGE

NAME _____
PRINT last first mi

SOCIAL SECURITY NUMBER _____ – _____ – _____

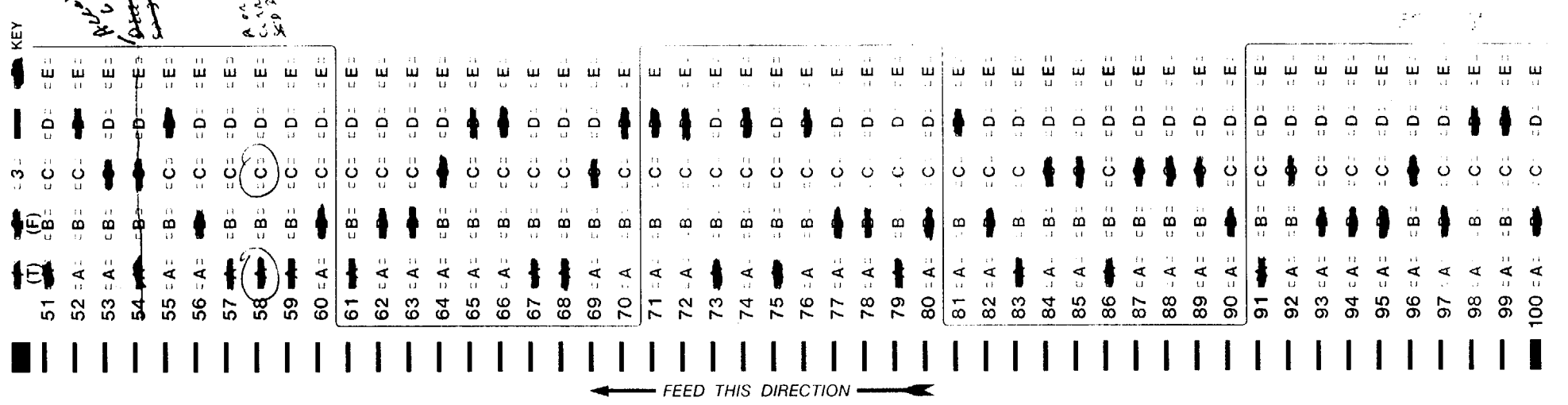
Checked 3/5/99

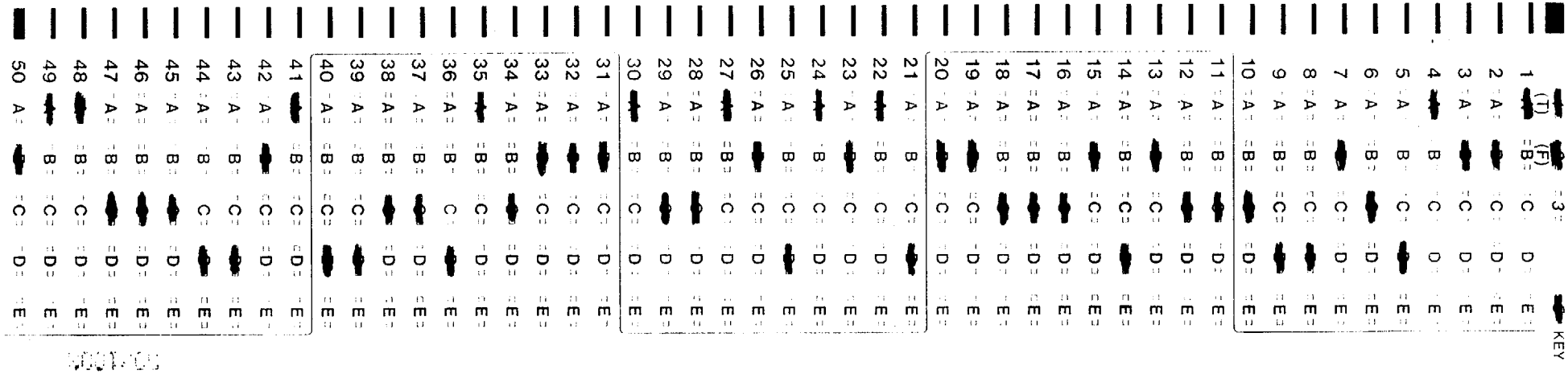
COMPANY / PECO PAYROLL # _____

DATE _____

I HAVE REVIEWED AND UNDERSTAND THE CORRECTED QUIZ; ALL WORK ON THIS EXAMINATION

IS MY OWN, I HAVE NEITHER GIVEN NOR RECEIVED ASSISTANCE _____
signature





PECO NUCLEAR

STATION PB / (LGS)

COURSE TITLE LOT

EXAM SRO

NAME _____
PRINT last first mi

SOCIAL SECURITY NUMBER ___ - ___ - ___

COMPANY / PECO PAYROLL # _____

DATE _____

IMPORTANT

- USE #2 PENCIL
- EXAMPLE: (A) (B) ● (D) (E)
- ERASE ***COMPLETELY*** TO CHANGE

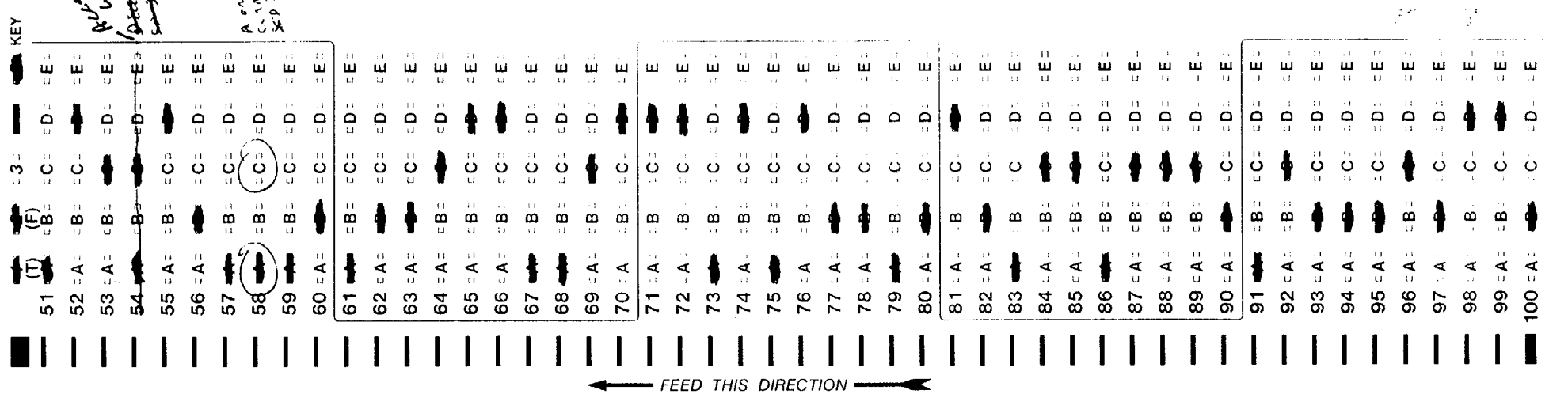
PART 1

Checked 3/5/99

William M. Tray

I HAVE REVIEWED AND UNDERSTAND THE CORRECTED QUIZ; ALL WORK ON THIS EXAMINATION IS MY OWN, I HAVE NEITHER GIVEN NOR RECEIVED ASSISTANCE _____
signature

PART 2



FEED THIS DIRECTION

«« EXAM INFORMATION »»

EXAM NO.: SROWRITTEN

DATE GENERATED: 02/11/99

TOTAL POINTS: 100.00

RESPONSE TIME (min): 0.0

AVERAGE DIFFICULTY : 1.9

MULT. CHOICE	TRUE FALSE	ESSAY	FILL IN	MATCHING
QUESTIONS:100 POINTS:100.00	QUESTIONS: 0 POINTS: 0.00	QUESTIONS: 0 POINTS: 0.00	QUESTIONS: 0 POINTS: 0.00	QUESTIONS: 0 POINTS: 0.00

1) *PV:1.0

Reactor power is 32%

LT-47-*N012D SDV level transmitter fails upscale resulting in a B2 half scram.

WHICH ONE of the following describes the resulting position of the SDV vent and drain valves.

a. ALL SDV vent and drain valves open

b. ALL SDV vent and drain valves closed

c. Inboard vent and drain valves open, outboard vent and drain valves closed.

d. Outboard vent and drain valves open, inboard vent and drain valves closed.

2) PV:1.0

A total loss of Instrument Air occurs.

Plant conditions are as follows:

- All scram valves are open with reactor power at 28%
- LI-48-1R601 on 10C603 SLC tank level reads 0 inches
- "STANDBY LIQUID TANK HI/LO LEVEL" alarm annunciates
- "STANDBY LIQUID TANK LO-LO LEVEL" alarm not lit

WHICH ONE of the following describes the response of the SLC system.

a. All SLC pumps are tripped on low level and will not start

b. All SLC pumps will start 118 seconds after RRCS is initiated

c. A & B pumps will start 118 seconds after RRCS is initated. C SLC pump is tripped on low level and will not start.

d. C SLC pump will start 118 seconds after RRCS is initiated. A & B pumps are tripped on low level and will not start.

3) PV:1.0

Plant conditions are as follows:

- A loss of offsite power has occurred for both units
- D12, D14, and D21 busses are de-energized

WHICH ONE of the following describes the loops of RHR that can be placed in Suppression Pool Cooling?

a. 1A and 2A

b. 1A and 2B

c. 1B and 2A

d. 1B and 2B

4) *PV:1.0

A chemical spill results in the following indications:

"A" and "C" Toxic Gas monitors tripped

"A" and "D" Control Enclosure Chlorine monitors upscale

WHICH ONE of the following describes CREFAS status?

a. will remain in standby, no CREFAS fan running

b. will automatically initiate only "A" CREFAS, with "A" CREFAS fan running

c. will automatically initiate only "B" CREFAS, with "B" CREFAS fan running

d. will automatically initiate both "A" and "B" CREFAS, both fans running

5) PV:1.0

Plant conditions are as follows:

- Reactor Level is +35"
- DIV 3 LOCA signal (-129") was initiated 10 minutes ago due to an excess flow check valve actuation
- "C" RHR pump is in full flow test for PMT

WHICH ONE of the following would result in an automatic initiation of ADS after 105 seconds?

a. RPV level drops below +12.5"

b. "A" RHR pump is started

c. RPV level drops below +12.5" and "A" RHR pump is started

d. RPV level drops below +12.5" and "B" RHR pump is started

6) *PV:1.0

WHICH ONE of the following identifies the parameter held constant by the HPCI Flow Controller when operating in "MANUAL" mode as reactor pressure changes?

a. discharge flow

b. control valve position

c. turbine speed

d. discharge pressure

7) PV:1.0

Unit 1 plant conditions are as follows:

- D13 bus is locked out
- RPV level is -140"
- RPV pressure is 230 psig

WHICH ONE of the following describes the status of "A" Loop Core Spray?

a. Not injecting, A and C pumps running on min flow

b. Injecting approximately 3000 gpm

c. Not injecting, A and C pumps off

d. Injecting approximately 6000 gpm

8) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor Pressure 300 psig
- Reactor Level -25 inches
- Drywell Spray is in service using "1A" RHR pump
- HV51-1F017A is closed in "MANUAL OVERRIDE"

The RPV pressure input signal to 1A RHR valve logic fails to 1100 psig

WHICH ONE of the following describes the response of the 1A RHR System?

a. HV51-1F017A re-opens, "MANUAL OVERRIDE" light lit

b. HV51-1F017A re-opens, "MANUAL OVERRIDE" light out

c. HV51-1F017A remains closed, "MANUAL OVERRIDE" light lit

d. HV51-1F017A remains closed, "MANUAL OVERRIDE" light out

9) *PV:1.0

Unit 1 plant conditions are as follows:

- "DIV 1 STEAM LEAK DETECTION" alarm lit due to high temperature in RCIC room
- "DIV 3 STEAM LEAK DETECTION" alarm not lit
- "RCIC STEAM LINE HI FLOW" alarm lit due to steam flow greater than 300% of rated

WHICH ONE of the following describes the expected status of the RCIC Isolation Valves?

	HV49-1F007 (RCIC Steam Line Inboard Isolation)	HV49-1F008 (RCIC Steam Line Outboard Isolation)
a.	open	open
b.	open	closed
c.	closed	open
d.	closed	closed

10) *PV:1.0

The plant is in OPCON 2 performing startup

IRM's on range 5 reading between 40 and 60

The SRM's are being withdrawn from the core with the following readings:

SRM:	A	B	C	D
CPS:	120	86	118	109

WHICH ONE of the following describes plant status?

	SRM RETRACT PERMIT Light	ROD OUT BLOCK
a.	on	yes
b.	off	yes
c.	on	no
d.	off	no

11) PV:1.0

During steady state operation at 50% power, 8 LPRM's fail downscale.

WHICH ONE of the following describes the effect on core thermal power P-1 calculations?

a. will abort and not run

b. will indicate less than actual power

c. will indicate actual power

d. will indicate greater than actual power

12) *PV:1.0

The plant is operating at 100% power

One RWCU filter/demin is removed from service.

RWCU remains in service at the same flowrate with 2 pumps, 1 filter/demin, and the DEMIN BYPASS (HV-44-*F044) throttled.

WHICH ONE of the following describes the trend on reactor water conductivity?

a. remain at the current value

b. drop and stabilize at a lower value

c. rise and stabilize at a higher value

d. rise continually until the second filter/demin is restored

13) *PV:1.0

Unit 2 is operating at 65% power during a power ascension.

RCIC is operating in Full Flow test for surveillance testing.

Feedwater Level Control is selected to Automatic 3-element control.

"2B" Reactor Feed Flow transmitter fails upscale.

WHICH ONE of the following is a problem associated with continued operation in this condition?

a. excessive "2A" RFP flow

b. reduced Recirc Pump NPSH

c. RFP suction header vibration

d. unplanned RCIC high level shutdown

14) *PV:1.0

The plant is operating at 95%

A leak occurs on the "A" recirc loop.

"A" recirc pump is shutdown and isolated.

Reactor level dropped to -50" and is stabilized at +30" 5 minutes later.

WHICH ONE of the following describes the status of seal purge flow to the recirc pumps?

	A Recirc Pump	B Recirc Pump
a.	in service	in service
b.	isolated	in service
c.	in service	isolated
d.	isolated	isolated

15) PV:1.0

Unit 1 was operating at 59% power when total feed flow drops to 15%.

Plant conditions are as follows:

- Reactor Power: 43%
- Recirc Speed: 28%
- Recirc Speed Demand 51%
- Feedwater restored with level stabilized at +35"
- Recirc deviation meter pegged upscale

WHICH ONE of the following describes the status of the recirc flow control system?

a. scoop tube is locked

b. runback signal is still present

c. manual controller has failed upscale

d. scoop tube positioner has failed to minimum

16) PV:1.0

The following sequence of events have occurred on Unit 2:

- A GP-4 (Rapid Plant Shutdown) was performed
- RPV water level initially dropped to -48" and has been restored to +38" and rising
- RPV pressure is 960 psig
- Drywell pressure is 0.4 psig

WHICH ONE of the following will prevent a HPCI High Level trip while maintaining HPCI automatic injection capability?

a. Depress Manual Isolation pushbutton

b. Close Steam Line Inboard Isolation valve (HV55-2F002)

c. Depress Turbine Trip while closing Steam Supply (HV55-2F001)

d. Place Flow Controller in "MANUAL" and reduce speed to 2000 rpm

17) PV:1.0

WHICH ONE of the following describes the significance of the yellow stripe on selected MCR instrumentation?

a. required by Appendix R

b. powered by Safeguard DC

c. operates in harsh environments

d. redundent indication at RSP

18) PV:1.0

WHICH ONE of the following describes the effect of a complete loss of cooling water to a control rod drive mechanism during power operation?

a. Index tube bowing

b. RPIS reed switch failures

c. Reduced life of the graphitar seals

d. Expansion of internal components causing binding

19) PV:1.0

The CRD Flow Controller (FV46-1F002B) fails open during power operation.

WHICH ONE of the following illustrates the expected change in CRDH system parameters?

	System Flow	Drive Water dp	Cooling Water dp
a.	higher	lower	higher
b.	higher	higher	higher
c.	lower	higher	lower
d.	lower	lower	lower

20) *PV:1.0

A Rod Sequence timer malfunction has occurred.

All insert signal times are increased by 8 seconds.

Rod 06-39 is at position 30.

WHICH ONE of the following describes rod 06-39 position after a single notch withdraw signal?

a. "00"

b. "02" to "28"

c. "30

d. "32" to "48"

21) *PV:1.0

Plant conditions are as follows:

- A Reactor Shutdown is in progress
- Reactor Power: 19%
- Next in-sequence rod: 18-31
- Rod 18-31 position: "12"
- Rod 18-31 target position: "08"

Rod 18-31 is Selected.

The "INSERT" Pushbutton is depressed and continously held for 30 seconds.

WHICH ONE of the following describes the status of rod 18-31?

a. settle at "10"

b. settle at "08"

c. settle at "06"

d. settle at "00"

22) *PV:1.0

** REFER TO THE ATTACHED REFERENCE **

Plant conditions are as follows:

- Generator load 1175 MWe
- Generator reactive load 225 MVAR (lagging)
- Generator H_2 Gas pressure 75 psig

The PSD requests generator load be maintained at 1175 MWe.

WHICH ONE of the following states the <u>additional</u> MVAR (lagging) capacity available?

a. 220

b. 275

c. 370

d. 455

23) PV:1.0

D11 Diesel is running loaded to 2850 KW for its monthly operability ST.

Unit 1 Reactor Level drops to -150".

WHICH ONE of the following describes the status of D11 Diesel and the Diesel Output breaker?

	D11 Diesel	Diesel Output Breaker
a.	Isochronous	Closed
b.	Isochronous	Open
c.	Droop	Open
d.	Droop	Closed

24) *PV:1.0

Unit 2 ADS/SRV indication is as follows on 20C626 panel:

ADS/SRV	Red Light	Green Light	Amber Light	White Light
"2A"	ON	OFF	ON	OFF
"2H"	OFF	ON	ON	ON
"2K"	OFF	ON	OFF	OFF
"2S"	ON	OFF	ON	ON

WHICH ONE of the choices below states the ADS/SRV that is currently automatically open due to high reactor pressure?

a. "2A'

b. "2H"

c. "2K"

d. "2S"

25) PV:1.0

Unit 1 plant conditions are as follows:

- ATWS in progress
- T-270 "Terminate and Prevent" is complete
- RPV level is -190" and dropping
- Emergency blowdown is in progress
- RPV pressure is 210 psig and dropping

WHICH ONE of the following actions will initiate Core Spray injection to the reactor?

a. Open Inboard (HV52-1F005) and Outboard (HV52-1F004A) valves

b. Start "1A" Core Spray pump, open Outboard (HV52-1F004A) valve

c. Close Inboard (HV52-1F005) valve, open Outboard (HV52-1F004A), reopen Inboard (HV52-1F005) valves

d. Start "1A" Core Spray pump, close Outboard (HV52-1F004A) valve, open Inboard (HV52-1F005), reopen Outboard (HV52-1F004A) valves

26) *PV:1.0

The Drywell N_2 Purge Supply (HV-57-*21) is currently administratively blocked closed.

WHICH ONE of statements below describes the bases for this configuration?

a. nitrogen vaporizer trip due to high flow

b. pressure suppression bypass during plant fires

c. inability of valves to close against nitrogen flow during purge

d. excessive SGTS drawdown time if other unit containment isolates

27) PV:1.0

The plant is operating at 75% power when the "B" Reactor Enclosure Vent Exhaust Duct Radiation Monitor fails downscale.

WHICH ONE of the following describes the status of Reactor Enclosure Ventilation and SGTS systems?

	RE Vent	SGTS
a.	operating	standby
b.	isolated	standby
c.	operating	initiated
d.	isolated	initiated

28) *PV:1.0

Unit 2 is in OPCON 5*.

The air supply to Refuel Floor Supply to SGTS damper (HV76-019) is lost.

WHICH ONE of the following describes the status of Refuel Floor Secondary Containment?

a. will be maintained by the operating RF ventilation fans

b. cannot be maintained following RF ventilation fan trip

c. will be maintained by SGTS initiation

d. cannot be maintained following SGTS flowpath closure

29) *PV:1.0

Unit 2 is operating at 80% power with Feedwater Level Control in Automatic, 3-element control.

The "2A" RFP MGU output fails upscale.

WHICH ONE of the following describes the expected plant response?

a. Reactor level decreases, reactor scrams on low level

b. Reactor level increases, all turbines trip on high level

c. "2B" & "2C" RFP speed decreases, level stabilizes at 35"

d. "2B" & "2C" RFP speed remains constant, level stabilizes at 40"

30) PV:1.0

Unit 1 is operating at 25% power when a load reject occurs.

WHICH ONE of the following states the valves that close to prevent a turbine overspeed trip?

a. Control and Intercept

b. Bleeder Trip and Bypass

c. Main Stop and Intermediate Stop

d. #2 Main Stop and Moisture Separator Dump

31) PV:1.0

Unit 1 is in OPCON 3

Zone 1 and 3 are inter-tied for shield block removal

Unit 2 Drywell pressure increases to 2.1 psig

WHICH ONE of the choices below states the zones aligned to SGTS?

a. Zone 1 only

b. Zone 2 only

c. Zones 2 and 3 only

d. Zones 1, 2, and 3

32) PV:1.0

Unit 2 plant conditions are as follows:

- The reactor has been shutdown due to a leak in the Drywell
- Drywell Spray is required
- D21 Safeguard Bus is de-energized

WHICH ONE of the following can be used to Spray the Drywell without locally operating components?

a. "2A" RHR pump

b. "2B" RHR pump

c. Fire Water System

d. RHR Service Water System

33) *PV:1.0

Unit 1 Turbine is being removed from service due to an EHC leak. The reactor is to remain critical.

Plant conditions are as follows:

- Reactor Power is 25%
- An "A" side half scram is present
- An EO in the Aux Equipment Room reports that PIS-01-1N652D, First Stage Turbine Pressure, is in the tripped condition

WHICH ONE of the following will prevent an automatic reactor scram when the Main Turbine is tripped?

a. transfer House Loads to reset PIS-01-1N652D

b. insert control rods until PIS-01-1N652D resets

c. reduce Generator reactive load with AUTO voltage adjust until PIS-01-1N652D resets

d. open Bypass valves until "TURBINE CONTROL/STOP VALVE SCRAM BYPASSED" alarm is lit

34) *PV:1.0

Plant conditions are as follows:

- Two in-series downcomer vacuum breakers are stuck open
- A LOCA occurs in the Drywell
- Drywell pressure stabilizes at 23 psig
- Suppression Pool level is 23.5 ft

WHICH ONE of the following indicates final Suppression Pool pressure?

a. 10 psig

b. 18 psig

c. 23 psig

d. 28 psig

35) PV:1.0

Plant conditions are as follows:

- Main Turbine tripped from 100% power
- 40 control rods failed to fully scram due to hydraulic lock
- Reactor Power is 5%
- Reactor Mode Switch is in "SHUTDOWN"
- CRD drive water pressure is 260 psid

WHICH ONE of the following describes why the RO cannot manually insert control rods?

a. RWM rod block

b. APRM rod block

c. Low CRD drive water pressure

d. Full Scram Discharge Volume

36) PV:1.0

Both Units are in OPCON 2

A loss of Offsite power occurs

WHICH ONE of the following describes the cooling water alignment for the Diesel Generators?

	Source	Return
a.	Cooling Tower	Cooling Tower
b.	Spray Pond	Cooling Tower
c.	Cooling Tower	Spray Pond
d.	Spray Pond	Spray Pond

37) *PV:1.0

A loss of all AC power occurs

E-1 directs Natural Ventilation to be established for HPCI and RCIC

WHICH ONE of the following describes why this action must be taken?

a. Service Water flow is lost

b. Reactor Enclosure Ventilation fans are off

c. HPCI and RCIC room unit coolers are de-energized

d. Steam Leak Detection temperature isolations occur

38) *PV:1.0

WHICH ONE of the following is an Immediate Operator Action for reactor high pressure?

a. lower Load Set

b. raise Load Limit

c. lower Pressure Set

d. raise Maximum Combined Flow

39) *PV:1.0

Unit 2 is operating at 100% power.

A Feedwater Level transmitter failure causes reactor level to drop to -5" for several seconds.

Reactor Power is 37%.

WHICH ONE of the following will allow control of RPV level using the Feedwater Master Controller?

a. "AUTO" mode with thumbwheel setpoint

b. "AUTO" mode with "OPEN" and "CLOSE" pushbuttons

c. "MANUAL" mode with thumbwheel setpoint

d. "MANUAL" mode with "OPEN" and "CLOSE" pushbuttons

40) PV:1.0

Unit 1 is in OPCON 5

- Suppression Pool Cooling is in service using the cross-tie and the "1C" RHR pump
- DIV 3 LOCA signal occurs

WHICH ONE of the following describes the resulting valve alignment for HV51-1F048A (Heat Exchanger Bypass) and HV51-1F017C ("C" LPCI Injection) valves?

	HV51-1F048A	HV51-1F017C
a.	open	open
b.	open	close
c.	close	close
d.	close	open

41) *PV:1.0

Unit 2 is at 90% power

- "LOSS OF SQUIB VALVE CONTINUITY" alarm annunciates
- Reactor power is lowering
- RWCU isolates

WHICH ONE of the following states required action and bases?

a. Scram the reactor due to uncontrolled reactivity insertion

b. Scram the reactor due to possible thermal limit violations

c. Secure SLC pumps due to regional power oscillations

d. Secure SLC pumps due to reactor coolant high conductivity

42) *PV:1.0

All Remote Transfer Switches are placed to "REMOTE" at the Unit 1 Remote Shutdown Panel.

WHICH ONE of the following describes the status of "RCIC STEAM LINE OUTBOARD ISOLATION" (HV-49-1F008) valve?

	MCR Control	Component Interlocks	Control Power
a.	Enabled	Active	Normal
b.	Disabled	Bypassed	Alternate
c.	Enabled	Bypassed	Alternate
d.	Disabled	Active	Normal

43) *PV:1.0

Plant conditions are as follows:

- Unit 1 is in OPCON 5
- Reactor cavity is flooded with spent fuel pool gates removed
- Both Reactor Well Top and Bottom seals, #3 and #4, have failed
- A Site Area Emergency has been declared due to offsite release

WHICH ONE of the following actions is required?

a. Enter and execute T-101

b. Enter and execute T-102

c. Enter and execute T-103

d. Enter and execute T-104

44) *PV:1.0

Unit 1 is in OPCON 5*

Unit 2 is in OPCON 1 with Drywell N_2 makeup in progress

A fuel bundle drops in the Unit 1 Spent Fuel Pool

Refuel Floor Exhaust Radiation levels increase to 5 mr/hr

WHICH ONE of the following states plant response?

	Unit 2 N_2 Makeup	RF Ventilation	SGTS
a.	aligned	in service	in standby
b.	isolated	in service	running
c.	aligned	isolated	in standby
d.	isolated	isolated	running

45) *PV:1.0

Plant conditions are as follows:

- Drywell Pressure: 24 psig
- Drywell Temperature: 250°F
- Suppression Pool level: 39.2 ft

WHICH ONE of the following bases states why Drywell Spray is prohibited?

a. excessive stress on SRV tailpipes

b. excessive Suppression Pool wall loading

c. excessive Suppression Pool to Drywell differential pressure

d. excessive pressure drop due to evaporative cooling

46) *PV:1.0

Plant conditions are as follows:

- Reactor is shutdown
- Suppression Pool level is 16.9 ft
- RCIC is injecting to the RPV, suction temp 106°F
- A RHR is in Suppression Pool Cooling, suction temp 115°F
- B RHR is secured, suction temp 97°F
- SPOTMOS indicated temp 128°F
- CST level is 33.5 ft.

WHICH ONE of the following describes the valid Suppression Pool temperature?

a. 97°F

b. 106°F

c. 115°F

d. 128°F

47) *PV:1.0

Plant conditions are as follows:

- Drywell temperature: 200°F
- Drywell Pressure: 23 psig
- Suppression Pool Pressure: 22.5 psig
- Suppression Pool Level: 13.1 ft
- Suppression Pool Water Temperature: 98°F

WHICH ONE of the following actions will allow use of RHR for Suppression Pool Spray?

a. vent the Drywell

b. vent the Suppression Pool

c. raise Suppression Pool level

d. reduce Suppression Pool temperature

48) *PV:1.0

Steam cooling is in progress per T-111, with the following conditions:

- RPV level is -196"
- No injection into the RPV

WHICH ONE of the following describes the status of the fuel?

	Adequate Core Cooling	Expected Peak Clad Temp
a.	yes	1800°F
b.	yes	2200°F
c.	no	1800°F
d.	no	2200°F

49) *PV:1.0

Plant conditions are as follows:

- An ATWS is in progress
- Plant Monitoring System (PMS) is inoperable

WHICH ONE of the following can be used to confirm that a control rod is fully inserted?

a. Green "IN" light is lit on the Full Core Display

b. Blue "SCRAM" light is lit on the Full Core Display

c. "- -" (two dashed lines) on the Four Rod Display

d. "X X" (two X's) on the Four Rod Display

50) *PV:1.0

Plant conditions are as follows:

- A South Vent Stack radiation release is in progress
- Unit 1 Containment Purge with air is in progress
- SGD-206-3 (Refuel Floor to SGTS connecting damper) is closed

WHICH ONE of the following describes the source of the rad release?

a. Unit 1 TEECE

b. Unit 1 REECE

c. Off-gas System

d. Unit 1 Containment Purge

51) *PV:1.0

Plant conditions are as follows:

- A LOCA is in progress
- Drywell H_2 - 3%
- Drywell O_2 - 8%
- Suppression Pool H_2 - 7%
- Suppression Pool O_2 - 4%

WHICH ONE of the following describes the T-102 Sheet 2 sections required to be performed?

a. DW/G-3 and SP/G-1

b. DW/G-2 and SP/G-2

c. DW/G-3 and SP/G-3

d. DW/G-2 and SP/G-1

52) *PV:1.0

Unit 2 is operating at 75% power

The "2B" steam pressure transmitter for EHC fails upscale

Reactor Mode Switch is placed in "SHUTDOWN"

Reactor pressure is 850 psig and lowering

WHICH ONE of the actions below will terminate this plant transient?

a. raise PRESSURE SET

b. lower BYPASS JACK

c. raise LOAD LIMIT

d. lower MAXIMUM COMBINED FLOW

53) *PV:1.0

Unit 1 is operating at 60% power

The "1C" RFP trips while being placed in service

The "1C" Low Pressure Heater string isolates

FLLLP is 1.104 and slowly rising

WHICH ONE of the following describes the effect on Thermal Power and reason for this trend?

a. rising due to rising Reactor Pressure

b. dropping due to lowering Reactor Level

c. rising due to loss of feedwater heating

d. dropping due to loss of feedwater flow

54) *PV:1.0

Unit 2 Remote Shutdown Panel is manned due to a fire in the MCR.

- Drywell Pressure: 2.5 psig
- DIV 3 DC power lost

WHICH ONE of the following states available pressure control?

a. "2A", "2C", or "2N" SRV

b. "2S", "2M", or "2K" SRV

c. "2A", "2C", or "2N" SRV only after Instrument Air backup

d. "2S", "2M", or "2K" SRV only after Instrument Air backup

55) *PV:1.0

** REFER TO THE ATTACHED REFERENCE **

Unit 1 plant conditions are as follows:

- Reactor Power: 70%
- LP Turbine Inlet Pressure: 84 psig
- Condenser Vacuum: 23.9" Hg

WHICH ONE of the following states action required?

a. raise recirc flow

b. raise "PRESSURE SET"

c. place the standby SJAE in service

d. trip the turbine within 5 minutes

56) *PV:1.0

Unit 1 DIV IV DC is deenergized.

E-1FD directs initiation of a Manual MCR Chlorine Isolation.

WHICH ONE of the following describes why the manual isolation is initiated?

a. minimizes heat load on CEHVAC System

b. ensures outside air is isolated to the MCR

c. prevents excessive positive MCR pressure

d. places MCR on recirc to ensure panel cooling

57) *PV:1.0

The following conditions exist:

- Unit 1 is at 100% power
- "1D" Narrow Range Level Transmitter is upscale

"1C" Feedwater Narrow Range Level Transmitter fails upscale.

WHICH ONE of the following states the status of the Reactor Feedpump Turbines and the Main Turbine?

	RFP Turbines	Main Turbine
a.	operating	operating
b.	tripped	tripped
c.	tripped	operating
d.	operating	tripped

58) *PV:1.0

Reactor Recirc pumps are required to be tripped during a loss of Instrument Air.

WHICH ONE of the following states the basis for this action?

a. loss of Recirc M-G set winding cooling

b. loss of Recirc M-G set oil cooling

c. loss of Recirc pump seal cooling

d. loss of Recirc pump oil cooling

59) *PV:1.0

Following a LOCA, the HV-C-01-1F020 (Main Steam Line Equalizer Valve) is closed and cannot be opened.

All MSIV's are closed.

WHICH ONE of the following describes how leakage past the MSIV seats is controlled?

a. directed to the Main Condenser via Main Stop Valve Above Seat Drain lines

b. directed to the Main Condenser via Hotwell Heating Coils

c. directed to the Reactor Enclosure via Main Steam Line Barrier Vent valves

d. directed to the Reactor Enclosure via "1C" Main Steam Line Vent

60) *PV:1.0

Unit 2 plant conditions are as follows:

- "2B" RHR operating in Shutdown Cooling in OPCON 4
- "2B" Reactor Recirc Pump SUCTION and DISCHARGE valves (HV43-2F023 and 2F031) are OPEN.
- Reactor Pressure: 25 psig
- "2B" RHR Suction Temperature: 120°F
- "2B" RHR Flow: 6200 gpm
- Reactor Level: +54"

WHICH ONE of the following reflects plant status?

	Shutdown Cooling Flow	Reactor Water Temperature
a.	thru core	120°F
b.	bypassing core	greater than 120°F
c.	thru core	greater than 120°F
d.	bypassing core	120°F

61) *PV:1.0

Plant conditions are as follows:

- RPV Pressure: 50 psig
- Drywell Pressure: 30 psig
- Drywell Temperature: 350°F
- Suppression pool level: 20.6 ft

Reactor Level indications:

- Wide Range: -70"
- Shutdown Range: +80"
- Upset Range: +60"
- Narrow Range: +10"
- Fuel Zone: Upscale

WHICH ONE of the following describes Reactor water level?

a. unknown

b. -60" to -80"

c. +0" to +20"

d. +70" to +90"

62) *PV:1.0

WHICH ONE of the following describes the basis for maximum Containment water level of 115.8 ft?

a. Drywell pressure tap becomes covered with water

b. Drywell Purge Exhaust line fills with water

c. Drywell Spray headers become covered with water

d. Drywell equipment hatch seal failure

63) *PV:1.0

Unit 1 is operating at 35%

TIP operations are in progress

Reactor water level drops to -75".

"REACTOR ENCLOSURE AREA HI RADIATION" Annunciates.

An EO reports "NEUTRON MONITORING SYSTEM AREA" ARM is alarming.

WHICH ONE of the following describes the status and cause of this MCR alarm?

a. expected, as TIP withdraws and stops at the indexer

b. expected, as TIP withdraws and stops at the shield

c. not expected, as TIP withdraws and stops at the indexer

d. not expected, as TIP withdraws and stops at the shield

64) *PV:1.0

Plant conditions are as follows:

- RWCU resin spill has occurred in the Reactor Enclosure
- Reactor Enclosure HVAC Exhaust rad level is 8.7 mr/hr
- T-290 readings above MNO as follows:
  RWCU "A" pump room 121 mr/hr
  RWCU regen Htx room 102 mr/hr

Access to the Reactor Enclosure is required.

WHICH ONE of the following actions is required?

a. isolate Refuel Floor HVAC

b. restore Reactor Enclosure HVAC

c. ensure Standby Gas Treatment System running

d. manually scram the reactor at 50% core flow

65) *PV:1.0

Unit 2 Reactor Power is 3%

"2A" Recirc Pump trips

WHICH ONE of the choices below states required Immediate Operator Action(s)?

a. SCRAM the Reactor and PLACE mode switch in "SHUTDOWN"

b. Drive rods to exit the Restricted Area of Power/Flow Map

c. Close "DISCHARGE" Valve (HV43-2F031A) for tripped Recirc Pump

d. MONITOR and CONTROL Reactor Level until normal level restored

66) *PV:1.0

Refueling activities are in progress on Unit 1.

All control rods are fully inserted.

A fuel bundle is being moved from the Spent Fuel Pool to the Core.

WHICH ONE of the following conditions is required if the Refuel Bridge is to enter the fuel transfer/cattle chute area at normal speed?

a. Auxiliary Hoists are not loaded

b. Boundary Zone Computer in "Bypass"

c. Reactor Mode Switch in "SHUTDOWN"

d. Grapple at the normal full up position

67) *PV:1.0

Plant conditions are as follows:

- Unit 1 is at 3% power
- Mechanical Vacuum Pump operating
- All MSIVs and Main Steam Line Drain valves open

"1A" and "1B" Main Steam Line Radiation Monitors both trip (>3xNFPB)

WHICH ONE of the following describes plant status?

	MSIVs	Steam Line Drains	Mechanical Vacuum Pump
a.	open	open	tripped
b.	isolated	open	running
c.	open	isolated	running
d.	isolated	isolated	tripped

68) *PV:1.0

Reactor power is 20%

Control Rod 28-29 is selected

WHICH ONE of the following describes Rod Block Monitor (RBM) status?

a. bypassed, will not enforce a rod block

b. bypassed, will enforce a rod block at 107%

c. enforcing, will enforce a rod block at 112%

d. enforcing, will enforce a rod block at 117%

69) *PV:1.0

Plant conditions are as follows:

- In OPCON 5
- Reactor Cavity is flooded
- Spent Fuel Pool gates are removed
- Reactor Cavity Water Level begins to drop
- Spent Fuel Pool makeup cannot stabilize Reactor Cavity Water Level

WHICH ONE of the following describes the long term effects?

	Fuel Pool Cooling Pumps	Fuel In Spent Fuel Pool
a.	tripped	uncovered
b.	running	uncovered
c.	tripped	covered
d.	running	covered

70) *PV:1.0

The following parameters are reported for Unit 1:

- HPCI Pump Room: 160°F
- RCIC Pump Room: 100°F
- "1A" & "1C" RHR Pump Room: 150°F
- HPCI Room Water Level: 8"
- All other T-290, "Instrumentation Available For T-103", parameters are normal

WHICH ONE of the following systems are no longer assured to be available for safe shutdown of the plant?

a. HPCI

b. RCIC

c. HPCI and RCIC

d. "1A" & "1C" RHR pumps

71) *PV:1.0

The Unit 2 RO is requested to support a PMT which requires data collection from the Containment Hydrogen Recombiner panel 2AC696.

The data will take 20 minutes to obtain.

WHICH ONE of the following describes the necessary steps for the RO to obtain the data?

a. notify the PRO, short term relief is not required

b. obtain CRS authorization, short term relief is not required

c. short term relief is required, no log entry is required

d. short term relief is required, log entry is required

72) *PV:1.0

The Unit is in OPCON 1

Manual Scoop Tube operation is required at the M-G set

The Floor Supervisor is standing by at the M-G set to provide needed support

WHICH ONE of the individuals below is permitted to manipulate the Scoop Tube?

a. Duty Reactor Engineer

b. Turbine Enclosure EO (nonlicensed)

c. Engineer in current SRO Certification class

d. EO in current RO licensing class

73) *PV:1.0

ST-6-092-364-1, D14 DIESEL GENERATOR OPERABILITY VERIFICATION, is in progress.

The EO working locally at the EDG reports that the procedure directs operation of LOCAL-REMOTE SELECTOR SWITCH "43-DG207".

The EO verifies that this switch number should be "43-DG501".

WHICH ONE of the following describes the actions necessary to complete this ST?

a. stop, submit a TC for the change and then continue

b. stop, submit a PPIS for the change and then continue

c. complete the ST, then submit a TC for the change

d. complete the ST, then submit a PPIS for the change

74) *PV:1.0

Clearance removal is being evaluated for Independent and Double Verification requirements?

Verification of several steps in the clearance will require exposure of 12 to 15 mR.

WHICH ONE of the following reflects verification requirements?

	Independent Verifications	Double Verifications
a.	can be waived	can not be waived
b.	can not be waived	can be waived
c.	can not be waived	can not be waived
d.	can be waived	can be waived

75) *PV:1.0

Plant conditions are as follows:

- An ATWS is in progress
- T-101, RPV CONTROL, and T-117, POWER/LEVEL CONTROL, are being implemented
- SAMP procedure entry is now required

WHICH ONE of the following states the procedures which are required to be implemented?

a. SAMPs only

b. SAMPs and T-101

c. SAMPs and T-117

d. SAMPs, T-101 and T-117

76) *PV:1.0

Plant conditions are as follows:

- Unit 2 is in OPCON 1
- Unit 1 is in OPCON 5, Refueling operations are in progress.
- D11 D/G is INOP
- D13 D/G is INOP

It is discovered that D14 D/G undervoltage relay 127-11X will not trip.

101 Safeguard Bus was removed from service two hours ago.

WHICH ONE of the following describes the required actions?

	Unit 1	Unit 2
a.	Restore at least one D/G within 12 hours or suspend core alts.	Restore off site source in 70 hr or shutdown.
b.	Core alts may continue indefinitely	Restore D13 or D14 to operable within 70 hours or shutdown
c.	Suspend core alts	Restore offsite source in 7 days or shutdown.
d.	Suspend core alts	Restore offsite source in 70 hours or shutdown

77) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor is shutdown
- Reactor Pressure: 300 psig
- Reactor Level: +34"
- Irradiated fuel is being moved in Unit 2 Spent Fuel Pool

The following battery charger test current data is provided:

CHARGER	CURRENT
1BCA1	310
1BCA2	324
1BCB1	291
1BCB2	279
1BCC	86
1BCD	97

WHICH ONE of the following describes the required Tech Spec action?

a. stop fuel movements

b. COLD SHUTDOWN in 32 hours

c. COLD SHUTDOWN in 36 hours

d. COLD SHUTDOWN in 44 hours

78) *PV:1.0

Plant conditions as follows:

- Unit 1 in OPCON 5
- Reactor Level is 217"
- "1A" RHR is in Shutdown Cooling
- HV-51-1F008, SHUTDOWN COOLING SUCTION OUTBOARD, fails closed and cannot be reopened.

WHICH ONE of the following describes actions that must be completed within 1 hour?

a. place "1B" RHR in Shutdown Cooling

b. place "1A" Recirc pump in service

c. raise Reactor Level to 490"

d. initiate SGTS aligned to Refuel Floor

79) *PV:1.0

Reactor Pressure reaches 1338 psig.

WHICH ONE of the following states the required actions?

	Notified	Future Critical Operations
a.	NRC within 1 hour	approved by NRC
b.	Plant Manager within 1 hour	approved by NRC
c.	NRC within 1 hour	approved by NRB
d.	Plant Manager within 1 hour	approved by NRB

80) *PV:1.0

Unit 1 is operating at 20% power.

Drywell Chilled Water Inboard and Outboard Isolation valves are bypassed.

WHICH ONE of the following describes the required Tech Spec action?

a. STARTUP in 12 hours, HOT SHUTDOWN within the following 24 hours

b. HOT SHUTDOWN within 12 hours, COLD SHUTDOWN within the following 24 hours

c. isolate Inboard valves within 12 hours, HOT SHUTDOWN within the following 12 hours

d. isolate Outboard valves within 12 hours, HOT SHUTDOWN within the following 24 hours

81) *PV:1.0

Unit 1 plant conditions are as follows:

- Reactor is Shutdown
- Reactor Level: -60" and slowly lowering
- CST Level: 26 ft
- HV-51-1F017A (LPCI INJECTION) valve is stuck closed
- "1B" RHR pump is injecting at 10,000 gpm

WHICH ONE of the following methods can be used to increase injection to the RPV?

a. T-240, Maximizing CRD flow

b. T-243, Alternate Injection from RHRSW

c. T-244, Alternate Injection from Fire Water

d. T-245, RPV Injection from RHR Shutdown Cooling

82) *PV:1.0

Unit 2 is at 37% power.

Both CRD pumps are tripped and cannot be started.

15 minutes later, 23 HCU Accumulator Trouble annunciators are alarming.

A GP-4 Shutdown is performed.

WHICH ONE of the following describes expected plant response?

a. 23 rods will not insert

b. all rods will insert with normal scram times

c. all rods will insert with significantly longer scram times

d. all rods will insert, only 23 rods will have significantly longer scram times

83) *PV:1.0

Unit 2 plant conditions are as follows:

- Reactor Power: 100%
- A/C RHR Pump Room Level: 20" and rising slowly

The source of the water leaking into the A/C RHR pump room has been determined to be the "2C" LPCI injection line (water is leaking past HV51-2F017C and through RHR Heat Exchanger inlet flange).

WHICH ONE of the following actions is required?

a. scram the Reactor, enter T-101

b. perform a GP-3, Normal Plant Shutdown

c. enter Tech Spec 3.5.1 for "2C" RHR pump INOP

d. perform Emergency Depressurization per T-112

84) *PV:1.0

The Main Control Room is abandoned due to high toxic gas concentrations.

Control has been established at the Remote Shutdown Panel per SE-1.

WHICH ONE of the following describes the level control mechanisms specified in SE-1?

a. manual RCIC control only

b. manual HPCI control only

c. manual RCIC control with HPCI cycling between +12.5" and +54"

d. manual HPCI control with RCIC cycling between +12.5" and +54"

85) *PV:1.0

Purging the Drywell with air per T-228 can only be performed if Drywell pressure is less than 0.75 psig.

WHICH ONE of the following describes the reason for this limitation?

a. prevents exceeding 1.68 psig Drywell pressure

b. prevents subjecting Post-LOCA Recombiner Blower to excessive suction pressure

c. allows Reactor Enclosure Supply fans to discharge air into the Drywell

d. ensures Drywell pressure remains within the operating range of the Downcomer Vacuum Breakers

86) *PV:1.0

The Refuel Platform Aux Hoist grapple is out of the water, and cannot be re-submerged due to Aux Hoist motor overload.

The West wall Fuel Floor ARM is alarming.

WHICH ONE of the following actions is required?

a. immediately evacuate the Fuel Floor

b. lower Aux Hoist grapple using the handcrank

c. place the alarming ARM mode switch to ZERO

d. reset the motor overload, then lower the Aux Hoist

87) *PV:1.0

Plant conditions are as follows:

- Reactor Pressure: 850 psig
- Drywell Pressure: 1.9 psig
- Drywell Temperature: 155°F
- Drywell Head Tank Level on PMS: "Low"
- "B" Drywell Chiller: running

WHICH ONE of the following actions is required?

a. start the "A" Drywell Chiller

b. align RECW to Drywell and bypass DWCW

c. bypass DWCW after verifying DWCW suction pressure greater than 35 psig

d. align RECW to Drywell after verifying RECW suction pressure greater than 80 psig

88) *PV:1.0

Plant conditions are as follows:

- An ATWS is in progress
- Reactor Power: 30%
- Reactor Pressure: 930 psig
- Suppression Pool Level: 23 ft
- Suppression Pool Temperature: 170°F

WHICH ONE of the following actions is required?

a. stabilize Reactor Pressure at 930 psig

b. raise Suppression Pool level to 26 ft

c. perform Emergency Depressurization per T-112

d. reduce Reactor Pressure to between 850 and 900 psig

89) *PV:1.0

WHICH ONE of the following protective devices may be reset, if the cause of the trip is thought to be known, without further investigation?

a. Control Rod Drive Pump Breaker magnetics

b. Core Spray Pump Breaker Relay Target

c. RHR Suppression Pool Cooling MOV Thermals

d. Drywell Chiller Breaker Auxiliary Relay Target

90) *PV:1.0

An EO is performing ST-6-041-241-1, Reactor Vessel Valve Test, which requires Drywell entry.

WHICH ONE of the following states procedural requirements for completing steps in the Drywell?

	PROCEDURE IN HAND	PROCEDURE
a.	required	original required
b.	required	copy permitted
c.	not required	original required
d.	not required	copy permitted

91) *PV:1.0

WHICH ONE of the following describes the tracking mechanism required for a non-safety related, motor-operated valve, backseated while hot to limit a bonnet pressure seal leak?

a. Equipment Status Tag the MOV handswitch and valve operator

b. apply an Equipment Trouble Tag to the MOV handswitch

c. apply an Administrative Clearance with activities to repair valve

d. enter a Regulatory Action Log entry in the Unified Control Room Log

92) *PV:1.0

WHICH ONE of the following describes appropriate use of a Special Condition Tag (SCT)?

a. manual valve with an existing SCT applied

b. air operator to a valve danger tagged "OPEN and GAGGED"

c. Y-panel feed tagged out in an energized state

d. motor feed with a green "SUSPENSION" label applied

93) *PV:1.0

** REFER TO THE ATTACHED REFERENCE **

Plant conditions are as follows:

- Unit 2 is in OPCON 5*
- Step #17 of the attached CCTAS is in progress
- LSRO reports the bundle is about 3 feet from being seated in location 45-48 NW

WHICH ONE of the following describes the Outage Shift Supervisor's direction to the Refuel Bridge?

a. seat the bundle, perform a pen and ink change to the CCTAS per RE-C-40, continue with Step #18

b. stop fuel moves until corrective actions are evaluated and appropriate management is informed

c. raise the bundle above the top guide, re-orient the bundle and inform Reactor Engineering for Shuffleworks update

d. complete the step, contact Reactor Engineering for Shutdown Margin determination, if satisfactory continue with step #18

94) *PV:1.0

WHICH ONE of the following must be done to use portions of ST-6-051-205-1 for a PMT on HV-051-1F017B?

a. mark Test Frequency as "N/A" and have SQR sign Test Results

b. write "PARTIAL" on the front page and have signed by an SQR prior to use

c. mark Test Results "PARTIAL" and annotate reason in Test Comments Section

d. write "N/A" on Acceptance Criteria and have signed by PRO/RO prior to use

95) *PV:1.0

Entry is required to a Level II Locked High Radiation Area.

WHICH ONE of the statements below describes requirements for entry to this area?

	HP Technician	Document Key Issue
a.	required	before entry
b.	required	after entry
c.	not required	before entry
d.	not required	after entry

96) *PV:1.0

An Operator has declared pregnancy.

WHICH ONE of the following tasks can she perform without a Special Exception?

a. apply block in Safeguard Room 309 posted as a Contaminated Area

b. restore Y-panel power in Radwaste MCC Room 145 posted as an Airborne Area

c. perform a C.O.L. on HCU's inside posted Radiation Area

d. complete an IV on HPCI valves in Feedwater Pipe Chase Room 407 posted as a High Radiation Area

97) *PV:1.0

An area on the Refuel Floor has been surveyed with the following results:

- 2 mrem/hr general area
- 2,000 dpm/100 cm^2 beta loose surface
- 10,000 cpm fixed on several Refuel Floor tools

WHICH ONE of the choices below describes the required posting for this area?

a. Radiation Area

b. Contaminated Area only

c. Red Zone only

d. Both Contaminated Area and Red Zone

98) *PV:1.0

You have declared an Alert.

During the initial 15 minute notifications, conditions change and you escalate to a Site Area Emergency.

WHICH ONE of the following describes the requirements for the initial 15 minute notification?

a. complete Alert notification, then perform notifications for a Site Area Emergency

b. continue Alert notification noting escalation to Site Area Emergency on remaining calls

c. stop Alert notification, perform notifications for a Site Area Emergency without noting escalation

d. stop Alert notification, perform notifications for a Site Area Emergency noting the escalation

99) *PV:1.0

An injured man has been reported on RE Elevation 217'.

WHICH ONE of the following will respond as a member of the Medical Team?

a. Shift Manager

b. Shift Technical Advisor

c. Medical Review Officer

d. Health Physics Technician

100) *PV:1.0

Plant conditions are as follows:

- SAMP procedures have been entered
- Reactor Level is unknown
- A reactor scram occurred 30 minutes ago; all rods fully inserted
- RPV Injection Flow: 700 gpm and stable
- Reactor Pressure: 280 psig and stable
- Suppression Pool Pressure: 20 psig
- Suppression Pool Level: 42 ft
- Drywell Pressure: 33 psig and stable

WHICH ONE of the following SAMP-1 sheets must be implemented?

a. Sheet 4

b. Sheet 5

c. Sheet 6

d. Sheet 7