

U. S. NUCLEAR REGULATORY COMMISSION
REGION 1

Docket Nos: 50-352, 50-353

Report Nos: 50-352/99-301, 50-353/99-301

Licensee: PECO Nuclear

Facility: Limerick Units 1 and 2

Location: Sanatoga, PA

Dates: March 12-19, 1999 (Administration)
March 22-March 26, 1999 (Grading)

Examiners: Steve Dennis, Operations Engineer, Chief Examiner under
Instruction
Herb Williams, Senior Operations Engineer, Chief Examiner
Carl Sisco, Operations Engineer

Approved By: Richard J. Conte, Chief
Human Performance and Emergency Preparedness Branch
Division of Reactor Safety

EXECUTIVE SUMMARY

Limerick Generating Station Examination Report No. 50-352,353/99-301

Operations

- Five RO applicants and four SRO applicants were administered initial licensing exams. One SRO applicant failed the written test but passed all other portions of the exam. One RO applicant failed the category B operating test but passed all other portions of the exam. All other applicants successfully passed all portions of the exam.
- Positive observations were noted on the simulator test in the area of communications and teamwork. However, three of nine applicants exhibited unsatisfactory individual knowledge of the reactor automatic depressurization system indicating a potential problem in the initial operator program.
- Overall, the as-submitted examination material was acceptable with some exceptions. Five of 125 written exam questions required revision due to either being too easy or not evaluating at the appropriate licensed level. Additionally, the operating test contained one JPM out of 20 which was also too easy and required replacement. Facility personnel subsequently incorporated changes in the final exams. Post-exam facility comments reflected needed technical corrections for five of the written exam questions, and also indicated a lack of thorough review on those questions by the facility during the examination preparation phase.
- The facility used an examination preparation team of experienced instructors who assisted the NRC examiners in an exceptional manner.

Report Details

Operations

05 Operator Training and Qualifications

05.1 Reactor Operator and Senior Reactor Operator Initial Exams

a. Scope

The NRC examiners reviewed the written and operating initial examinations submitted by the facility staff to ensure that they were prepared and developed in accordance with the guidelines of the "Examination Standards for Power Reactors" (NUREG-1021, Interim Revision 8). The review was conducted both in the Region 1 office and at the Limerick training facility. The NRC examiners administered the operating portion of the exam to all candidates. The written exams were administered by the facility's training organization.

b. Observations and Findings

Grading and Results

The results of the exams are summarized below:

	<u>SRO</u>		<u>RO</u>	
	Pass	Fail	Pass	Fail
Written	3	1	5	0
Operating	4	0	4	1
Overall	3	1	4	1

The facility provided post-examination comments reflected technical corrections to five of the written exam questions. The NRC accepted four of the comments and revised the answer key accordingly. The changes indicated also a lack of thorough review on those questions by the facility during the exam preparation phase. Attachment 1 is the NRC staff resolution of facility post-examination comments (Attachment 2).

Examination Preparation and Quality

The written exams, job performance measures (JPMs) and simulator scenarios were developed by the facility using the guidelines of the examination standards. The exam development team was comprised of training and operations representatives. All individuals signed onto a security agreement once the development of the exam commenced. The NRC subsequently reviewed and approved all portions of the proposed exams.

Five of 125 written exam questions required revision due to either being too easy or not evaluating at the appropriate licensed level. The operating test contained one JPM out of 20 which was replaced also due to being too easy. In response to the written and operating test comments, facility personnel subsequently incorporated changes in the final exams.

The facility used an examination preparation team of experienced instructors who assisted the NRC examiners in an exceptional manner.

Written Test Performance

The facility training department performed an analysis of questions missed on the written exam for generic weaknesses. The facility noted seven examples where four of the applicants missed the same question. The training staff subsequently determined the questions met the guidance of NUREG 1021, Appendix B, and were technically accurate. Facility staff stated they would review these questions with the applicants. This action was determined to be acceptable.

Operating Test Administration and Performance

The applicants demonstrated good communications and teamwork during the simulator exercises in both the routine and emergency portions of the exercise. Briefings were routinely conducted by the applicants when in the control room supervisor position. The briefings were well controlled and ensured that all personnel knew the plant (simulator) status. One RO applicant failed the category B operating portion of the exam and all other applicants performance were acceptable.

One question on the operating test dealing with the reactor automatic depressurization system (ADS) was missed by three applicants out of nine. This question failure rate indicated a potential problem with the initial operator program dealing with knowledge of the ADS logic for opening the ADS valves. This issue was discussed with the licensee and they agreed to review the area.

c. Conclusions

Five RO applicants and four SRO applicants were administered initial licensing exams. One SRO applicant failed the written examination but passed all other portions of the exam. One RO applicant failed the category B operating examination but passed all other portions of the exam. All other applicants successfully passed all portions of the exam.

Positive observations were noted on the simulator test in the area of communications and teamwork. However, three of nine applicants exhibited unsatisfactory individual knowledge of the reactor automatic depressurization system indicating a potential problem in the initial operator program.

Overall, the as-submitted examination material was acceptable with some exceptions. Five of 125 written exam questions required revision due to either being too easy or not evaluating at the appropriate licensed level. Additionally, the operating test contained one JPM out of 20 which was also too easy and required replacement. Facility personnel subsequently incorporated changes in the final exams. Post-exam facility comments reflected needed technical corrections for five of the written exam questions, and also indicated a lack of thorough review on those questions by the facility during the examination preparation phase.

The facility used an examination preparation team of experienced instructors who assisted the NRC examiners in an exceptional manner.

O8 Miscellaneous Operations Issues

During a review of the candidates' applications, the examiners determined that: 1) the candidates had performed the required number of significant reactivity control manipulations; 2) the candidates met eligibility guidelines of NUREG 1021 and Reg. Guide 1.8 as applicable; and 3) the licensing basis documents for eligibility requirements (i.e., the Quality Assurance Plan, Technical Specifications, the Final Safety Analysis Report, and the licensed operator program requirements as accredited) were consistent. The licensee is committed to ANSI/ANS 3.1-1978.

The eligibility requirements of one senior reactor operator instant (SROI) applicant were reviewed. With the assistance of the NRC program office regarding the acceptance of military reactor operator experience to fulfill experience requirements, the NRC staff determined that the eligibility requirements were met for the SROI in question.

X1 Exit Meeting Summary

On March 19, 1999, exam-related observations were discussed with the manager of Operations Training. The NRC expressed appreciation for the cooperation and assistance that was provided during both the preparation and exam week by the licensee's examination team.

There were no observed discrepancies between the simulator and the plant. Therefore, simulator fidelity was not discussed at the exit meeting or in this report.

Attachments:

1. NRC Resolution of Facility Comments
2. Facility Comments on the Written Examination
3. RO Written Exam w/Answer Key
4. SRO Written Exam w/Answer Key

Attachment 1

NRC RESOLUTION OF FACILITY COMMENTS

SRO/RO #54

Summary of Facility Comment

The question asked which SRV's were available for pressure control given the conditions that the Unit 2 remote shutdown panel (RSP) was manned due to a fire in the MCR, high drywell pressure existed, and Division 3 DC power was lost.

The facility stated that the question stem did not discriminate between automatic pressure control (overpressure lift setpoint reached) or manual pressure control. Additionally, the facility stated, if the candidate assumed automatic pressure control, then instrument air backup would not be required for any SRV's. Consequently, the facility recommended accepting either "a" or "c" as the correct answer.

Resolution of Facility Comment

The NRC staff agreed with the facility's comment that, if the candidate assumed automatic pressure control, SRV's are operable at their respective overpressure lift setpoints. The setpoint for the "N" SRV is 1170 psig. This SRV has controls at the remote shutdown panel. The other SRVs listed have a higher setpoint and some are not controlled at the remote shutdown panel. With the reactor shut down, the heat removal capacity of the "N" SRV exceeds the decay heat load, and would be the controlling SRV in the automatic mode of operation. This would make answer "a" correct. If only manual control is assumed, answer "c" is correct. Therefore, NRC staff accepted answers "a" and "c".

SRO/RO#58

Summary of Facility Comment

The question asked why the Recirc pumps are required to be tripped during a loss of instrument air.

The facility provided the basis document for the loss of instrument air off-normal procedure, ON-199 Rev.14. The procedure stated that, upon the loss of instrument air, recirc pump seal purge and motor airspace cooling will be lost; and, therefore, the recirc pumps must be tripped per procedure step 2.6.1. Consequently, the facility recommended accepting either "a" or "c" as the correct answer.

Resolution of Facility Comment

The NRC staff accepted the facility's comment and revised the answer key to accept answers "a" and "c" as correct because the facility training staff provided a technical basis to support the recommendation.

Attachment 1 (Cont'd)**NRC Resolution of Facility Comments****RO #94****Summary of Facility Comment**

The question asked the MCR response to an alarming overhead annunciator caused by an ongoing I&C test. Specifically, the performance of Main Steam Line Flow High channel B calibration functional test (ST-2-041-425-2) caused overhead annunciator "MAIN STEAM LINE HI FLOW" to alarm.

The facility stated that operations procedure OM-L-7.1, step 5.1.2, indicates that it is at the operator's discretion to permit non-operators to acknowledge MCR alarms, in which case, answer "c" is correct. The procedure also states an exception to this step in which only licensed personnel shall be permitted to acknowledge alarming RPS annunciators. The "MAIN STEAM HI FLOW" trip units provide a Group 1 isolation signal which results in a RPS trip signal. Because of this relationship, a RO who treats the this alarm in the same fashion as an RPS alarm is taking reasonable and conservative action. Therefore, answer "a" is also correct.

Resolution of Facility Comment

The question asks what is the "required MCR response." In this case, the alarming annunciator is not a RPS alarm (defined as an overhead alarm tile with a RED triangle in the corner) and, therefore, by procedure can be acknowledged by other non-operations personnel with RO concurrence (answer "c"). While the RO is taking reasonable and conservative action by treating the main steam line alarm in the same fashion as a RPS alarm, it is NOT a *requirement* that only the RO be permitted to acknowledge the alarm (answer "a"). By procedure, the alarm may still be acknowledged by the I&C technician with RO concurrence, making answers "a" and "c" mutually exclusive. Therefore, the NRC staff denies the facility comment and accepts answer "c" as the only correct answer.

RO#96**Summary of Facility Comment**

The question asked to describe the status of core alterations if the refuel bridge has lost communications with the MCR RO while removing a bundle from the core.

The facility stated that the question stem did not stipulate at what point in the fuel movement sequence the communications failure occurred. Therefore, answer "d," that stated "core alterations must be suspended immediately and the bundle must not be raised or lowered," would also be correct, if the candidate assumed the failure occurred just after grappling the bundle in the core.

Attachment 1 (Cont'd)**NRC Resolution of Facility Comments**Resolution of Facility Comment

The NRC staff accepted the facility's comment and revised the answer key to accept answers "b" and "d" as correct because the facility training staff provided a procedural basis to support the recommendation.

RO #98Summary of Facility Comment

The question asked to describe the action to be taken after exiting a posted contamination area and observing during a whole body frisk that your highest reading was 120 cpm above background readings.

The facility stated that an additional correct answer would be to reperform the frisk, and if readings are unchanged, contact HP. This answer, as well as the original correct answer, is supported and described in procedure HP-C-818-1, Whole Body Frisking Method. Therefore, answers "b" and "d" are correct.

Resolution of Facility Comment

The NRC staff reviewed Exhibit HP-C-818-1, Rev.4. A note at the top of procedure HP-C-818-1 and steps E. and F. support answer "b." Therefore, the NRC staff accepted the facility's comment and revised the answer key to accept answers "b" and "d" as correct.

Attachment 2

FACILITY COMMENTS ON THE WRITTEN EXAMINATION



PECO NUCLEAR

A Unit of PECO Energy

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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

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

REACTOR COOLANT SYSTEM

3/4.4.2 SAFETY/RELIEF VALVES

JUST TO SHOW
LIFT PRESSURES

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.

MOD - Remote s/b panel operation

FAX

PECO Nuclear
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Date 4/9/99

Number of pages including cover sheet _____

To: HERB WILLIAMS

From: PETE ORPHANOS

Limerick Training Center

Nuclear Training Section

Mail Code LTC 1/1

Phone _____
Fax Phone _____
CC: _____

Phone (610) 718-4010
Fax Phone (610) 718-4028

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.

- Drywell pressure: 2.5 psig
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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

REF 5 55 12:30 FROM ETC TRAINING CHIR TO 00070000

REACTOR PRESSURE CONTROL

SE-1, Rev. 43
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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).

LGS UFSAR

Table 5.2-2

NUCLEAR SYSTEM SAFETY/RELIEF VALVE SETPOINTS

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

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

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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	S (OFF)
①	A	⊗ 1F013A	1F037A 1F097A	1AT003	1F036A	1N004A	C1259	115A-1	115A-2	115A	1B5921	
	B	1F013B	1F037B 1F097B	---	---	1N004B	C1271	115B-1	115B-2	115B	1B5921	
	C	⊗ 1F013C	1F037C 1F097C	1CT003	1F036C	1N004C	C1272	115C-1	115C-2	115C	1A5921	
	D	1F013D	1F037D 1F097D	---	---	1N004D	C1273	115D-1	115D-2	115D	1B5921	
②	A	⊗ 1F013E	1F037E 1F097E	1ET003	1F036E	1N004E	C1274	115E-1	115E-2	115E	1B5921	
	B	1F013F	1F037F 1F097F	---	---	1N004F	C1275	115F-1	115F-2	115F	1B5921	
	C	1F013G	1F037G 1F097G	---	---	1N004G	C1276	115G-1	115G-2	115G	1A5921	
	D	⊗ 1F013H	1F037H 1F097H	1HT003	1F036H	1N004H	C1277	115H-1	115H-2	115H	1A5921	
③	A	1F013J	1F037J 1F097J	---	---	1N004J	C1278	115J-1	115J-2	115J	1B5921	
	B	⊗ 1F013K	1F037K 1F097K	1KT003	1F036K	1N004K	C1279	115K-1	115K-2	115K	1B5921	
	C	1F013L	1F037L 1F097L	---	---	1N004L	C1280	115L-1	115L-2	115L	1A5921	
	D	⊗ 1F013M	1F037M 1F097M	1MT003	1F036M	1N004M	C1281	115M-1	115M-2	115M	1A5921	
④	A	SPARE	---	---	---	---	---	---	---	---	---	
	B	⊗ 1F013N	1F037N 1F097N	1NT003	1F036N	1N004N	C1282	115N-1	115N-2	115N	1B5921	
	C	---	---	---	---	---	---	---	---	---	---	
	D	⊗ 1F013S	1F037S 1F097S	1ST003	1F036S	1N004S	C1283	115S-1	115S-2	115S	1A5921	

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

TABLE V

STEAM FLOW INSTRUMENTATION

Q54

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.

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 *OC130A(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.

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

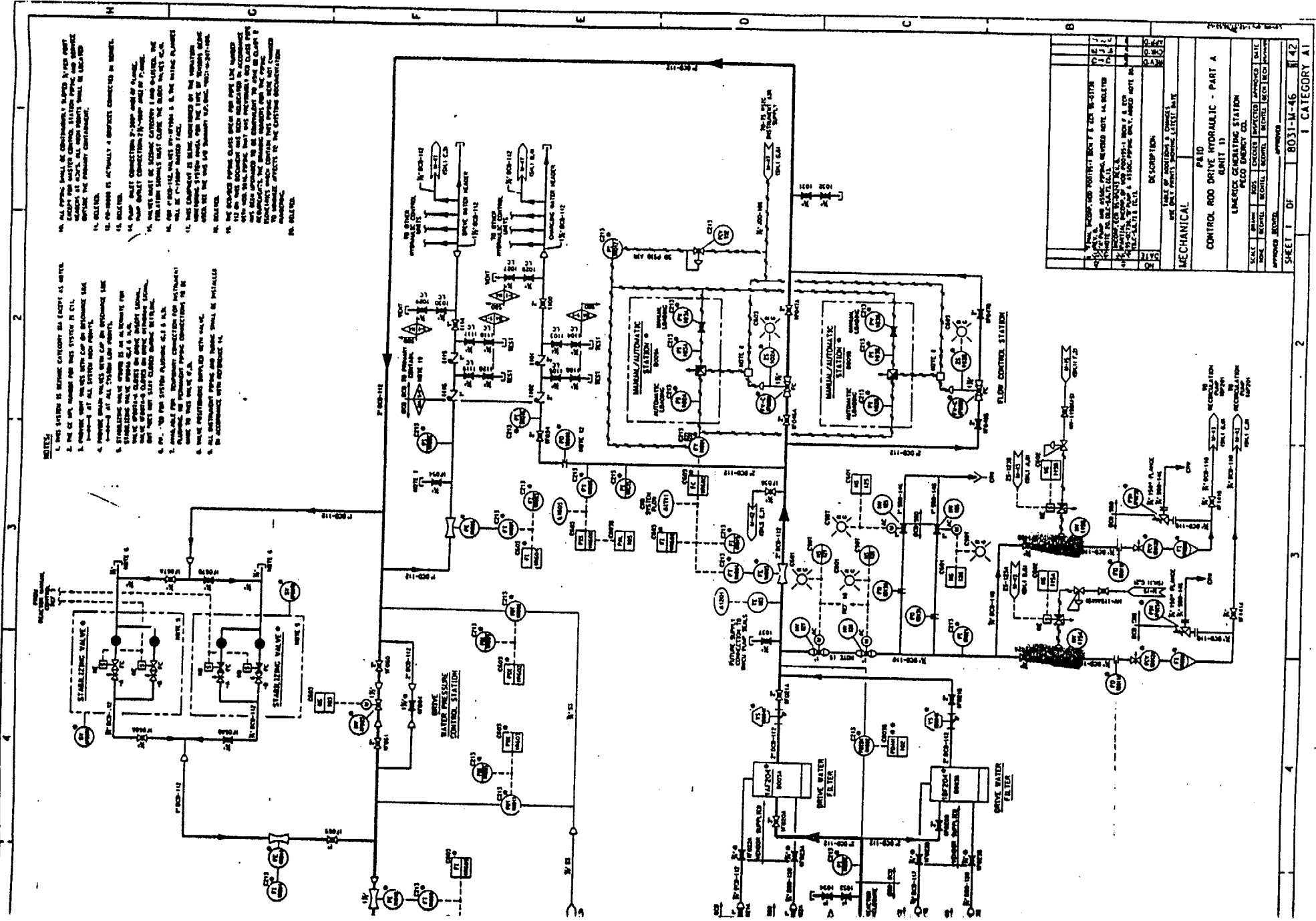
3.2.10 T-100, SCRAM

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 DESIGN CATEGORY SA EXCEPT AS NOTED.
 2. THE CE, CM, NUMBER FOR THIS SYSTEM IS 111.
 3. PROVIDE UNIT VALVES WITH CAP OR BUSHING, THE NUMBER AT ALL SYSTEM UNIT POINTS.
 4. PROVIDE SHIELD VALVES WITH CAP OR BUSHING, THE NUMBER AT ALL SYSTEM UNIT POINTS.
 5. STABILIZING VALVE OPERATES IN AN INVERSE PROPORTIONAL MANNER TO THE DRIVE MOTOR SPEED. THE VALVE OPERATES TO MAINTAIN THE DRIVE MOTOR SPEED WITHIN 10% OF THE SET POINT.
 6. THE DRIVE MOTOR SPEED IS CONTROLLED BY THE DRIVE MOTOR SPEED CONTROL VALVE.
 7. THE DRIVE MOTOR SPEED IS CONTROLLED BY THE DRIVE MOTOR SPEED CONTROL VALVE.
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3	11/1/58	ISSUED FOR CONSTRUCTION
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8	11/1/58	ISSUED FOR CONSTRUCTION
9	11/1/58	ISSUED FOR CONSTRUCTION
10	11/1/58	ISSUED FOR CONSTRUCTION

SCALE	DATE	BY	CHECKED	APPROVED	DATE
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10	11/1/58	ISSUED FOR CONSTRUCTION

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

REFUELING OPERATIONS

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.

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.

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 cm² 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.

Attachment 3

RO WRITTEN EXAM W/ANSWER KEY

«« 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 initiated. 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?

	<u>HV49-1F007</u> (RCIC Steam Line Inboard Isolation)	<u>HV49-1F008</u> (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?

- | | <u>SRM RETRACT PERMIT Light</u> | <u>ROD OUT BLOCK</u> |
|----|---------------------------------|----------------------|
| 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?

- will abort and not run
- will indicate less than actual power
- will indicate actual power
- 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?

	<u>A Recirc Pump</u>	<u>B Recirc Pump</u>
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. redundant 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?

	<u>System Flow</u>	<u>Drive Water dp</u>	<u>Cooling Water dp</u>
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 continuously 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 additional 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?

	<u>D11 Diesel</u>	<u>Diesel Output Breaker</u>
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:

<u>ADS/SRV</u>	<u>Red Light</u>	<u>Green Light</u>	<u>Amber Light</u>	<u>White Light</u>
"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 N₂ 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?

<u>RE Vent</u>	<u>SGTS</u>
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?

- | | <u>Source</u> | <u>Return</u> |
|----|---------------|---------------|
| 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?

	<u>HV51-1F048A</u>	<u>HV51-1F017C</u>
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
- RWCUC 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?

<u>MCR Control</u>	<u>Component Interlocks</u>	<u>Control Power</u>
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 OPGON 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 N2 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?

<u>Unit 2 N2 Makeup</u>	<u>RF Ventilation</u>	<u>SGTS</u>
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?

	<u>Adequate Core Cooling</u>	<u>Expected Peak Clad Temp</u>
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 H2 - 3%
- Drywell O2 - 8%
- Suppression Pool H2 - 7%
- Suppression Pool O2 - 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?

- | | <u>RFP Turbines</u> | <u>Main Turbine</u> |
|----|---------------------|---------------------|
| 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?

<u>Shutdown Cooling Flow</u>	<u>Reactor Water Temperature</u>
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?

	<u>MSIVs</u>	<u>Steam Line Drains</u>	<u>Mechanical Vacuum Pump</u>
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?

- | | <u>Fuel Pool
Cooling Pumps</u> | <u>Fuel In Spent
Fuel Pool</u> |
|----|------------------------------------|------------------------------------|
| 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?

<u>Independent Verifications</u>	<u>Double Verifications</u>
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?

- | <u>Floor Drain</u> | <u>Equipment Drain</u> |
|------------------------|------------------------|
| 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?

- | | <u>LPCI Injection
Valve (2F017B)</u> | <u>Shutdown Cooling
Return Valve (2F015B)</u> |
|----|--|---|
| 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 CO2 line in Cable Spread Room
- c. select "ABORT" on panel outside Cable Spread Room
- d. isolate CO2 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?

	<u>Unit 1 Turbine</u>	<u>Unit 2 Turbine</u>
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 O2 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?

	<u>Full Flow Test</u> <u>HV51-1F024A</u>	<u>Pool Spray</u> <u>HV51-1F027A</u>
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?

	<u>SLC Pumps</u>	<u>SLC Squib Valves</u>
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?

- | | <u>1B RFP</u> | <u>Reactor Water Level</u> |
|----|---------------|----------------------------|
| 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:

<u>IRM</u>	<u>RANGE</u>	<u>READING</u>
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?

- Bypass C IRM
- Perform a GP-4 shutdown
- Immediately scram the reactor
- 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?

- "securing the CRD pump"
- "inserting SRMs and IRMs"
- "placing the Mode Switch in Shutdown"
- "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

1	(T)	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E
41	A	B	C	D	E
42	A	B	C	D	E
43	A	B	C	D	E
44	A	B	C	D	E
45	A	B	C	D	E
46	A	B	C	D	E
47	A	B	C	D	E
48	A	B	C	D	E
49	A	B	C	D	E
50	A	B	C	D	E

PART 1

IMPORTANT

- USE #2 PENCIL
- EXAMPLE: A B C D E
- ERASE COMPLETELY TO CHANGE

STATION PB / CGS Ro

EXAM Ro

PECO NUCLEAR
COURSE TITLE LOT

NAME Richard first 3/5/99 last

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

Richard M. Troy
3/5/99

signature

PART 2

KEY

51	(T)	B	C	D	E
52	A	B	C	D	E
53	A	B	C	D	E
54	A	B	C	D	E
55	A	B	C	D	E
56	A	B	C	D	E
57	A	B	C	D	E
58	A	B	C	D	E
59	A	B	C	D	E
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66	A	B	C	D	E
67	A	B	C	D	E
68	A	B	C	D	E
69	A	B	C	D	E
70	A	B	C	D	E
71	A	B	C	D	E
72	A	B	C	D	E
73	A	B	C	D	E
74	A	B	C	D	E
75	A	B	C	D	E
76	A	B	C	D	E
77	A	B	C	D	E
78	A	B	C	D	E
79	A	B	C	D	E
80	A	B	C	D	E
81	A	B	C	D	E
82	A	B	C	D	E
83	A	B	C	D	E
84	A	B	C	D	E
85	A	B	C	D	E
86	A	B	C	D	E
87	A	B	C	D	E
88	A	B	C	D	E
89	A	B	C	D	E
90	A	B	C	D	E
91	A	B	C	D	E
92	A	B	C	D	E
93	A	B	C	D	E
94	A	B	C	D	E
95	A	B	C	D	E
96	A	B	C	D	E
97	A	B	C	D	E
98	A	B	C	D	E
99	A	B	C	D	E
100	A	B	C	D	E

FEED THIS DIRECTION

Attachment 4

SRO WRITTEN EXAM W/ANSWER KEY

«« 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 initiated. 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?

	<u>HV49-1F007</u> (RCIC Steam Line Inboard Isolation)	<u>HV49-1F008</u> (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?

	<u>SRM RETRACT PERMIT Light</u>	<u>ROD OUT BLOCK</u>
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?

<u>A Recirc Pump</u>	<u>B Recirc Pump</u>
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. redundant 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?

	<u>System Flow</u>	<u>Drive Water dp</u>	<u>Cooling Water dp</u>
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 continuously 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 additional 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?

	<u>D11 Diesel</u>	<u>Diesel Output Breaker</u>
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:

<u>ADS/SRV</u>	<u>Red Light</u>	<u>Green Light</u>	<u>Amber Light</u>	<u>White Light</u>
"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 N₂ 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?

- | <u>RE Vent</u> | <u>SGTS</u> |
|----------------|-------------|
| 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?

- will be maintained by the operating RF ventilation fans
- cannot be maintained following RF ventilation fan trip
- will be maintained by SGTS initiation
- 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?

- | | <u>Source</u> | <u>Return</u> |
|----|---------------|---------------|
| 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?

	<u>HV51-1F048A</u>	<u>HV51-1F017C</u>
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
- RWCUC 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?

<u>MCR Control</u>	<u>Component Interlocks</u>	<u>Control Power</u>
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 N2 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?

<u>Unit 2 N2 Makeup</u>	<u>RF Ventilation</u>	<u>SGTS</u>
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?

	<u>Adequate Core Cooling</u>	<u>Expected Peak Clad Temp</u>
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 H₂ - 3%
- Drywell O₂ - 8%
- Suppression Pool H₂ - 7%
- Suppression Pool O₂ - 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?

- | | <u>RFP Turbines</u> | <u>Main Turbine</u> |
|----|---------------------|---------------------|
| 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?

- | <u>Shutdown Cooling Flow</u> | <u>Reactor Water Temperature</u> |
|------------------------------|----------------------------------|
| 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 ($>3 \times \text{NFPB}$)

WHICH ONE of the following describes plant status?

	<u>MSIVs</u>	<u>Steam Line Drains</u>	<u>Mechanical Vacuum Pump</u>
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?

- | | <u>Fuel Pool
Cooling Pumps</u> | <u>Fuel In Spent
Fuel Pool</u> |
|----|------------------------------------|------------------------------------|
| 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?

<u>Independent Verifications</u>	<u>Double Verifications</u>
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:

<u>CHARGER</u>	<u>CURRENT</u>
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?

- | | <u>Notified</u> | <u>Future Critical Operations</u> |
|----|-----------------------------|-----------------------------------|
| 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?

	<u>PROCEDURE IN HAND</u>	<u>PROCEDURE</u>
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?

	<u>HP Technician</u>	<u>Document Key Issue</u>
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 cm² 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

1 (T) (F) 3 KEY

2 A B C D E

3 A B C D E

4 A B C D E

5 A B C D E

6 A B C D E

7 A B C D E

8 A B C D E

9 A B C D E

10 A B C D E

11 A B C D E

12 A B C D E

13 A B C D E

14 A B C D E

15 A B C D E

16 A B C D E

17 A B C D E

18 A B C D E

19 A B C D E

20 A B C D E

21 A B C D E

22 A B C D E

23 A B C D E

24 A B C D E

25 A B C D E

26 A B C D E

27 A B C D E

28 A B C D E

29 A B C D E

30 A B C D E

31 A B C D E

32 A B C D E

33 A B C D E

34 A B C D E

35 A B C D E

36 A B C D E

37 A B C D E

38 A B C D E

39 A B C D E

40 A B C D E

41 A B C D E

42 A B C D E

43 A B C D E

44 A B C D E

45 A B C D E

46 A B C D E

47 A B C D E

48 A B C D E

49 A B C D E

50 A B C D E

IMPORTANT

- USE #2 PENCIL
- EXAMPLE: A B C D E
- ERASE COMPLETELY TO CHANGE

STATION PB / LGS
EXAM SRO

PECO NUCLEAR
COURSE TITLE LOT

NAME PRINT _____
first last

SOCIAL SECURITY NUMBER _____
Checked 3/5/99

COMPANY / PECO PAYROLL # _____
Signature: M. Tray

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: *Michael A. ...*

51 (T) (F) 3 KEY

52 A B C D E

53 A B C D E

54 A B C D E

55 A B C D E

56 A B C D E

57 A B C D E

58 A B C D E

59 A B C D E

60 A B C D E

61 A B C D E

62 A B C D E

63 A B C D E

64 A B C D E

65 A B C D E

66 A B C D E

67 A B C D E

68 A B C D E

69 A B C D E

70 A B C D E

71 A B C D E

72 A B C D E

73 A B C D E

74 A B C D E

75 A B C D E

76 A B C D E

77 A B C D E

78 A B C D E

79 A B C D E

80 A B C D E

81 A B C D E

82 A B C D E

83 A B C D E

84 A B C D E

85 A B C D E

86 A B C D E

87 A B C D E

88 A B C D E

89 A B C D E

90 A B C D E

91 A B C D E

92 A B C D E

93 A B C D E

94 A B C D E

95 A B C D E

96 A B C D E

97 A B C D E

98 A B C D E

99 A B C D E

100 A B C D E