U. S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET/REPORT NOS: 50-293/95-27

LICENSEE: Boston Edison Company (BECo)

FACILITY: Pilgrim Nuclear Power Station

LOCATED AT: Plymouth, Massachusetts

EXAMINATION DATES: November 22-December 1, 1995

EXAMINERS: D. Florek, Senior Operations Engineer
J. Caruso, Operations Engineer
K. Kolaczyk, Operations Engineer

CHIEF EXAMINER: Don Florek 1/19/96
Donald Florek, Sr Operations Engineer Date
Operator Licensing and
Human Performance Branch
Division of Reactor Safety

APPROVED BY: Glenn W. Meyer 1/19/96
Glenn W. Meyer, Chief Date
Operator Licensing and
Human Performance Branch
Division of Reactor Safety

EXAMINATION SUMMARY

Examination Report 50-293/95-27 (OL)

Initial examinations were administered to four senior reactor operator (SRO) instant applicants, one SRO upgrade applicant and three reactor operator (RO) applicants during the period of November 22, 1995, through December 1, 1995, at Pilgrim Nuclear Power Station.

OPERATIONS

One of three RO applicants passed the examination. The upgrade applicant and two of the four instant SRO applicants passed the examination. One RO applicant failed the walk-through portion of the operating examination. One RO and two SRO instant applicants failed the walk-through and simulator portion of the operating examination.

Numerous weaknesses were noted during the operating portion of the examination and often involved execution of procedural steps and self-checking.

DETAILS

1.0 INTRODUCTION

The NRC administered initial examinations to four senior reactor operator (SRO) instant applicants, one senior reactor operator upgrade applicant, and three reactor operator (RO) applicants. The examinations were administered as part of the NRC pilot process that used the resources of Pilgrim to propose a written and operating test and for Pilgrim to administer and grade the written examination. The examinations were administered in accordance with the pilot program implementation instructions issued to assure consistency with NUREG-1021, "Examiner Standards," Revision 7.

2.0 PREEXAMINATION ACTIVITIES

The Pilgrim staff developed the written and operating examinations and submitted these proposed examinations for NRC review and approval. The NRC reviewed the Pilgrim staff's proposals, provided comments, and approved the examination for administration. The examinations administered reflected incorporation of the NRC comments and met NRC standards.

The NRC staff reviewed the written examination in the office and provided substantial comments to the Pilgrim staff prior to the on-site examination administration. The comments typically related to the cognitive level and discrimination ability of the questions. The written examination was authorized for administration by the NRC on November 21, 1995, and was administered by the Pilgrim staff on November 22, 1995. The final RO and SRO written examination are contained in Attachments 1 and 2.

The NRC staff reviewed and prepared for the operating examination as much as possible in the office. The NRC provided substantial comments for incorporation into the examination, which were incorporated into the examination by the Pilgrim staff. These comments related to the cognitive level and discrimination ability of the job performance measures (JPMs) and follow-up questions, as well as enabling the scenarios to evaluate across the level of competencies required of the Examiner Standards. The JPMs and simulator scenarios were reviewed on the Pilgrim simulator during the examination week prior to administration. These reviews also required changes to the examinations, which were subsequently made. The Pilgrim staff, who were involved with the examination development, signed security agreements to ensure that the initial examinations were not compromised.

3.0 EXAMINATION RESULTS AND RELATED FINDINGS, OBSERVATIONS AND CONCLUSIONS

3.1 Examination Results

The results of the examinations are summarized below:

	SRO Pass/Fail	RO Pass/Fail
Written	5/0	3/0
Operating	3/2	1/2
Overall	3/2	1/2

After the written examination administration, the Pilgrim staff identified several comments that needed to be made to the written examination. The facility comments provided are contained in Attachment 3. Pilgrim provided six comments on the written examination. Based on the NRC review, five of the six comments were accepted as proposed. The NRC accepted the sixth facility comment, but deleted the question from the examination rather than change the answer key. The NRC resolution of the facility comments is contained in Attachment 4. As a result of the comments and resolution, two questions were determined to have two correct answers, two questions were deleted from the SRO written examination, two questions were deleted from the RO written examination, and one answer was changed.

3.2 Applicant Weaknesses

The following is a summary of the applicant weaknesses noted during initial examination administration. No strengths were noted. This information is being provided to aid the facility in upgrading their training program.

<u>Written Examination</u>

Questions related to the following specific topics were missed by at least half of the applicants, indicating a weakness in the general understanding of the subject:

SRO-3	Knowledge of the TEDE exposure limits for planned special exposures.
SRO-23	Ability to predict, following an ATWS, the status of reactor power considering the effect of boron and xenon.
SRO-31, RO-98	Ability to predict drywell/torus vacuum breaker response.
SRO-47, RO-44	Knowledge of the rod block monitor response to a failure of the APRM.

SRO-75	Knowledge of the operator actions following closure of the off-gas isolation valve.
SRO-88, RO-81	Ability to predict the HPCI response to a set of conditions.
SRO-90, RO-84	Knowledge of the operator actions regarding RBCCW to a set of conditions.
SRO-98	Knowledge of the elevation of the drywell vents.
RO-99	Knowledge of the basis for operation of bus B-13 breakers during a LOCA.
RO-72	Ability to predict HPCI response with the controller in manual.
RO-51	Knowledge of the impacts of the diesel generator TEST/NORMAL switch.
RO-46	Ability to predict the response to an odd number reed switch stuck in the closed position.

Operating Examination

Several weaknesses were identified during the operating examination. These weaknesses were based on multiple occurrences.

The applicants experienced difficulty in the execution of several Pilgrim procedures. The procedural areas that evidenced difficulty include: reset of the feedwater regulating valve (FRV), equalize around and reopen MSIVs, operation of HPCI from the alternate shutdown panel, RPV level determination using the density compensator aid, responding to an LPRM upscale failure, responding to a loss of condenser vacuum and execution of EOP-27.

In addition to procedure execution, several tasks were incorrectly performed and involved self checking errors. These included reset of the FRV, restart of a recirc pump, verification of RBIS isolation, bypass of the wrong LPRM, swapping CRD pumps, and swapping fuel pool pumps.

Also, weak understanding and ability existed during the operating examination in the following areas:

- SRO knowledge of the effluent technical specifications.
- Knowledge of refueling operations.
- Ability to diagnose and to respond to HPCI and RCIC controller faults.
- Knowledge of HPCI and RCIC response to faults.
- Knowledge of the effect of the loss of the MG set speed signal on the recirculation pump #2 limiter.

- Ability to use electrical prints. Several applicants did not refer to electrical prints when it was appropriate, and on several instances when they did, they incorrectly answered the question.

- Knowledge of the effect of SRV operation on the fuel zone level instruments.

- RO knowledge of the radiological release consequences of an Alert.

- Knowledge of RHR response to LPCI initiation signals while in torus cooling.

- Ability to predict the response to actuating the bypass valve opening jack switch to raise while the plant is at 100% power.

- Ability to predict plant response to a loss of one steam flow transmitter.

3.3 Other Observations

During the exam week review of the operating test, many errors were identified and corrected by the Pilgrim and NRC staff in the operating test material developed by the Pilgrim staff. Nonetheless, during the administration of the walk-through examination, additional errors were noted in the examination material developed by the Pilgrim staff. Examples of the errors included incorrect equipment location stated in the question stem, incorrect instrument numbers in several question stems, and incomplete data in the question stem. These errors were identified during the first examination administration, and were corrected in the subsequent examinations. The examiners concluded that these errors did not have a significant negative impact on the applicant's performance, nor on the validity of the examination.

The general material condition of the plant was good. Housekeeping was also noted to be good, with exception of the spent fuel pool area. However, in the spent fuel pool area, the examiner noted numerous objects were suspended by rope in the pool and were tied off on the fuel pool handrails. The examiner was concerned with the potential for unanticipated radiation exposures, such as was highlighted in NRC Information Notice 90-33: Sources of Unexpected Occupational Radiation Exposures at Spent Fuel Storage Areas. At the exit, the Pilgrim management acknowledged the examiner's concerns and stated they were in the process of reducing the amount of material in the spent fuel pool. The examiner judged this approach to be appropriate.

4.0 EXIT MEETING

An exit meeting was conducted on December 1, 1995. The examiners expressed appreciation to Pilgrim for their participation in the pilot process. The support given by all of the Pilgrim personnel provided valuable information on the affects of the pilot process. The examiners noted that the problems in the examination development were overcome, and the end product, which required a dedicated effort on the part of the facility staff, resulted in an examination that was able to discriminate safe operators. Preliminary generic weaknesses on the operating tests were also presented.

The Pilgrim staff provided feedback that they had received valuable lessons in this pilot process. The most significant comment was that the process involved considerable more effort and resources than was anticipated. The Pilgrim staff indicated that, if this process is implemented in future examinations, then Pilgrim would need to plan for the resources a year in advance to assure the independence of the exam development team. This might require the use of contractors to supplement the staff. Due to the relatively short notice for the pilot process, Pilgrim had not budgeted for this effort and essentially developed the examination on an "overtime" basis.

Persons contacted and attendees at the exit meeting are listed below:

Licensee Personnel

J. Alexander, Training and Management Services Manager
J. Calfa, Senior Engineer
T. Collis, Senior Nuclear Training Specialist
W. Green, Senior Nuclear Training Specialist
L. Olivier, Vice President Nuclear Operations
M. Perito, Assistant Operations Department Manager
T. Sullivan, Plant Manager
T. Swan, Operations Training Department Manager
T. Trepanier, Operations Department Manager

NRC Personnel

J. Caruso, Operations Engineer
D. Florek, Sr. Operations Engineer
K. Kolaczyk, Operations Engineer

Attachments:
1. Final RO Examination and Answer Key
2. Final SRO Examination and Answer Key
3. Facility comments on written examinations
4. NRC resolution of facility comments on the written examinations
5. Simulation Facility Report

ATTACHMENT 1

FINAL RO EXAMINATION AND ANSWER KEY

RO FINAL

PILGRIM NUCLEAR POWER STATION
RO NRC INITIAL LICENSING EXAMINATION

FACILITY: Pilgrim 1

REACTOR TYPE: BWR-GE3

DATE ADMINISTERED: ______________

CANDIDATE: ______________________

INSTRUCTIONS TO CANDIDATE:

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

NUMBER QUESTIONS	TOTAL POINTS	CANDIDATE'S POINTS	CANDIDATE'S OVERALL GRADE (5)

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

____
Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

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

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

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

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

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

6. Fill in the date on the cover sheet of the examination (if necessary).

7. You may write your answers on the examination question page or on a separate sheet of paper. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

8. If you write your answers on the examination question page and you need more space to answer a specific question, use a separate sheet of the paper provided and insert it directly after the specific question. DO NOT WRITE ON THE BACK SIDE OF THE EXAMINATION QUESTION PAGE.

9. Print your name in the upper right-hand corner of the first page of answer sheets whether you use the examination question pages or separate sheets of paper. Initial each of the following answer pages.

10. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.

11. If you are using separate sheets, number each answer and skip at least three (3) lines between answers to allow space for grading.

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

13. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.

14. The point value for each question is indicated in parentheses after the question. The amount of blank space on an examination question page is NOT an indication of the depth of answer required.

NRC Rules and Guidelines for License Examinations (cont.)

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

16. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK. NOTE: Partial credit will NOT be given on multiple choice questions.

17. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.

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

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

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

21. There is a time limit of 4 hours for completion of the examination.

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

NAME: _____________________________

DATE: _____________________________

RO Licensing Exam of November 22, 1995

ANSWER KEY

1.0	_____	26.0	_____	51.0	_____	76.0	_____
2.0	_____	27.0	_____	52.0	_____	77.0	_____
3.0	_____	28.0	_____	53.0	_____	78.0	_____
4.0	_____	29.0	_____	54.0	_____	79.0	_____
5.0	_____	30.0	_____	55.0	_____	80.0	_____
6.0	_____	31.0	_____	56.0	_____	81.0	_____
7.0	_____	32.0	_____	57.0	_____	82.0	_____
8.0	_____	33.0	_____	58.0	_____	83.0	_____
9.0	_____	34.0	_____	59.0	_____	84.0	_____
10.0	_____	35.0	_____	60.0	_____	85.0	_____
11.0	_____	36.0	_____	61.0	_____	86.0	_____
12.0	_____	37.0	_____	62.0	_____	87.0	_____
13.0	_____	38.0	_____	63.0	_____	88.0	_____
14.0	_____	39.0	_____	64.0	_____	89.0	_____
15.0	_____	40.0	_____	65.0	_____	90.0	_____
16.0	_____	41.0	_____	66.0	_____	91.0	_____
17.0	_____	42.0	_____	67.0	_____	92.0	_____
18.0	_____	43.0	_____	68.0	_____	93.0	_____
19.0	_____	44.0	_____	69.0	_____	94.0	_____
20.0	_____	45.0	_____	70.0	_____	95.0	_____
21.0	_____	46.0	_____	71.0	_____	96.0	_____
22.0	_____	47.0	_____	72.0	_____	97.0	_____
23.0	_____	48.0	_____	73.0	_____	98.0	_____
24.0	_____	49.0	_____	74.0	_____	99.0	_____
25.0	_____	50.0	_____	75.0	_____	100.0	_____

1.0

A tagout that requires independent verification is being performed , and the tagout includes an inaccessible valve in the containment. The valve has already been closed and de-energized by an existing tagout. The method used for independent verification is:

A. The persons that performed the existing tagout must be the verifiers.

B. The tagout cannot be done until the existing tagout is cleared.

C. The verifiers must independently energize the breaker and verify the valve position.

D. The verifiers must independently use the existing tagout to determine the valve's position.

2.0

Select the ONE statement that correctly describes the tagging order (sequence) for pumps.

A. Main power breaker, discharge valve, suction valve, control switch, auxiliary power breaker.

B. Control switch, suction valve, discharge valve, main power breaker, auxiliary power breaker.

C. Control switch, main power breaker, auxiliary power breaker, discharge valve, suction valve.

D. Main power breaker, auxiliary power breaker, control switch, discharge valve, suction valve.

3.0

Select the ONE statement below that is correct concerning the procedure utilized to defeat an annunciator window.

A. If required due to a malfunctioning component (pressure switch) in the annunciator circuit, a temporary modification tag is attached to that component.

B. All annunciators defeated with temporary modifications are identified with a temporary modification tag in the affected window.

C. The lifted lead and jumper log is used to log all annunciators defeated with temporary modifications.

D. A sticker or yellow tag attached to the annunciator window is used to identify defeated annunciators.

4.0

Select the ONE statement below that correctly describes the requirement(s) for independent verification when removing or installing a tagout.

A. The Fire Chief must perform the independent verification if it involves the fire protection system.

B. A NRC Licensed Operator shall perform the independent verification for controls located in the control room.

C. A qualified, Non-Licensed Operator may perform independent verification for controls located in the control room.

D. A NRC Licensed Senior Reactor Operator must perform the independent verification for controls located in the control room.

5.0

While making rounds, a plant operator, using his key card, is unable to enter a vital area for which he has access.

Select the ONE statement below that correctly describes the use of the medico vital area key.

A. Use a medico vita area key to enter and notify security when leaving the area.

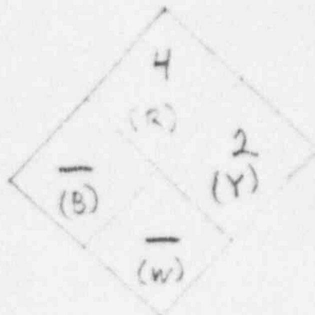
B. Notify Security prior to entering and then use the medico vital area key to enter.

C. Use a medico vital area key to obtain entry; notification of Security is not required.

D. Do not use a medico vital area key in this situation.

6.0

The following symbol appears on a bottle that has spilled:



(R) - red background
(B) - blue background
(Y) - Yellow background
(W) - White background

Regarding the liquid spilled:

A. It is an extreme fire hazard and not a caustic hazard.

B. It is an extreme fire hazard and a moderate caustic hazard.

C. It is a slight fire hazard and not a caustic hazard.

D. It is a slight fire hazard and a moderate caustic hazard.

7.0

Regarding the attendant's duties for a confined space:

A. The attendant may monitor more than one adjacent permit-required confined space and may perform rounds on nearby areas.

B. The attendant may monitor more than one adjacent permit-required confined space and may not perform rounds on nearby areas.

C. The attendant may not monitor more than one adjacent permit-required confined space and may perform rounds on nearby areas.

D. The attendant may not monitor more than one adjacent permit-required confined space and may not perform rounds on nearby areas.

8.0

The "A" CRD pump motor has a Green tag on it.

SELECT the statement that describes the non-emergency operating concerns of the CRD pump.

A. The pump cannot be operated except at the request of the permit holder or designee.

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

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

D. The pump cannot be operated unless the tag is cleared/removed.

9.0

Which one of the following is the reason that total core flow should be maintained above 27.6 Mlb/hr., and flow through the operating recirculation loop should not exceed 34.5 Mlb/hr when >100% load line during single loop operation?

A. (1) prevent temperature stratification in the core, (2) NPSH of the operating recirculation pump

B. (1) prevent temperature stratification in the core, (2) NPSH of the operating jet pumps.

C. (1) prevent cooldown of the idle recirculation loop, (2) NPSH of the operating recirculation pump.

D. (1) prevent cooldown of the idle recirculation loop, (2) NPSH of the operating jet pumps

10.0

A complex, planned evolution is to be performed. Select the statement which BEST describes the requirements for performance:

A. The NOS will conduct a pre-evolution briefing and will assign the planned evolution duties to the Licensed Operator who has the control room duties.

B. The NOS will conduct a pre-evolution briefing and will assign the planned evolution duties to a second Licensed Operator that does not have the control room duties.

C. The NOS will not conduct a pre-evolution briefing and will assign the planned evolution duties to the Licensed Operator who has the control room duties.

D. The NOS will not conduct a pre-evolution briefing and will assign the planned evolution duties to a second Licensed Operator that does not have the control room duties.

11.0

WHICH ONE of the following individuals is allowed to make changes to the Reactor Recirculation flow rate while the reactor is at power?

A. A system engineer, holding an inactive SRO license, to check valve response, provided consent from the NPRO at the controls is obtained.

B. A licensed RO from another station in the SRO training program and under the direction of the lead training instructor.

C. An unlicensed individual in the SRO Training Program, after having the consent of the Shift Control Room Engineer.

D. An individual is currently enrolled in a licensed operator training program and is under the direct supervision of the NPRO.

12.0

WHICH ONE of the following describes the minimum posting and minimum radiation protection actions required for a room with whole body dose rates of 500 mRem/hr and loose surface contamination 1500 dpm/square-cm in gamma only?

A. radiation area; no contaminated area.

B. radiation area; contaminated area.

C. high radiation area; contaminated area.

D. high radiation area; no contaminated area.

13.0

WHICH ONE of the following contains the minimum radiation level that requires a Radiation Work Permit (RWP)?

A. 1 Rem/hr

B. .1 Rem/hr

C. .01 Rem/hr

D. .001 Rem/hr

14.0

When resetting a scram, it is necessary to place the Air Dump System Test Switch to the "ISOLATE" position. Why is this required?

A. The "Isolate" position shifts the SPVAH dump valve air supply point allowing the SPVAH dump valve to reset and the SPVAH to repressurize.

B. The "Isolate" position supplies air to close the scram pilot valves which then allows the SPVAH to repressurize the SPVAH dump valve.

C. The "Isolate" position isolates the SPVAH which allows the scram pilot valves to close.

D. The "Isolate" position supplies air to close the backup scram valves which then allows the SPVAH to repressurize

15.0

When starting up following a refueling outage, a group of control rods is at position 32 when the plant reaches 100% power. Coupling integrity on these rods is verified by:

A. Verifying nuclear instrument response with these control rods during the startup.

B. Verifying RPIS indication changes as each rod is withdrawn.

C. Withdrawing each rod to position "48" to verify coupling, then returning it to its required position prior to exceeding 25% power.

D. No coupling check is required on these rods when power is greater than 25%.

16.0

If the Reactor Manual Control (RMC) master timer fails, uncontrolled rod withdrawal using the Rod Movement Control Switch is prevented by. . . .

A. generating a select block, if the withdrawal portion of the sequence lasts for two or more seconds.

B. generating a withdrawal block, if the withdrawal portion of the sequence lasts more than 1.5 seconds.

C. the auxiliary timer generating a withdraw block if the notch sequence lasts longer than 2 seconds.

D. the automatic sequence timer generating both an insert and withdrawal block after 1.5 seconds.

17.0

Select the expected automatic response to the trip of one feedwater pump while operating at 100% power.

A. Reactor recirculation pumps immediately run back to 44% speed.

B. Reactor recirculation pumps run back to minimum speed when the low level alarm is received.

C. Reactor recirculation pumps run back to 44% speed when the RPV low level alarm is received.

D. The reactor will scram on low RPV level if no operator action is taken.

18.0

The plant is operating at 100% power with the individual feed regulator valves in MANUAL when the feedwater flow summer fails downscale. What is the effect on plant conditions with no operator action?

A. Recirculation pump speeds remain the same and the reactor scrams on low RPV level.

B. The recirculation pumps run back to 20% speed, and the reactor scrams when the turbine trips on high level.

C. The recirculation pumps run back to 26% speed, and the reactor scrams when the MSIVs shut.

D. The recirculation pumps speed remain the same and the reactor scrams when the turbine trips on high level.

Deleted

19.0

The reactor has just scrammed from full power due to low level. Level continues to decrease.

- 10:27 the lo lo level alarm sounds
- 10:35 the drywell pressure reaches 2.6 psig
- 10:50 reactor pressure is 450 psig

Both recirculation pumps are running and no loop break was detected. WHICH ONE of the following describes the status of the LPCI system based upon the current given information?

A. The LPCI pumps are running and the selected injection valve is closed.

B. The LPCI pumps are running and the selected injection valve is open.

C. The LPCI pumps are not running and the selected injection valve is closed.

D. The LPCI pumps are not running and the selected injection valve is open.

20.0

With the plant initially at 100% of rated conditions, a leak in recirc loop "A" generates a valid LOCA signal of 2.2 psig in the drywell. Concerning the response of the RHR system, determine which of the following is TRUE:

A. The white lights below the LPCI INJECTION VALVES (MO-1001-29A & 29B) illuminate (SDC isolation lights).

B. All RHR containment valves except the TORUS COOLING VALVES (MO-1001-36A & 36B) auto close.

C. The HX BYPASS VALVES (MO-1001-16A & 16B) open for one minute and are interlocked open for 5 minutes, along with the LPCI INJECTION THROTTLE VALVE (MO-1001-28B).

D. The LPCI INJECTION THROTTLE VALVE (MO-1001-28A) and the LPCI INJECTION VALVE (MO-1001-29A) are sealed closed for 10 minutes.

21.0

WHICH ONE of the following describes the normal operation of the high pressure coolant injection (HPCI) minimum flow valve (MO-2301-14) with its control switch in the AUTO position?

A. Normally closed, automatically opens on HPCI initiation and automatically closes when the HPCI injection valve indicates full open.

B. Normally open, automatically closes after HPCI initiation and system flow is greater than 800 gpm.

C. Normally open and automatically closes when the HPCI injection valve indicates full open.

D. Normally closed, automatically opens on HPCI initiation and closes after system flow is greater than 800 gpm.

22.0

The condensate transfer system is out of service. The "A" and "B" core spray suction valves are closed to isolate a suppression pool leak. Select which ECCS pumps will be impacted by the above conditions.

A. The "A" and "B" core spray pumps are the only ECCS electric pumps affected

B. The core spray system is the only ECCS system which lost keep fill pressure

C. Keep fill is lost to the suction piping of all ECCS electric pumps

D. Keep fill is lost to the discharge piping of all ECCS electric pumps

23.0

Assume RPV level is +48 inches and RPV pressure is 1050 psig. BOTH will remain constant. 60 minutes following a full power ATWS, 1100 gallons of sodium pentaborate has been injected into the RPV and completely mixed. Which of the following describes the reactor when the sodium pentaborate was injected and twelve hours later due to xenon decay.

A. The reactor should be shutdown, and be less subcritical after 12 hours due to xenon decay.

B. The reactor should be shutdown, but before 12 hours have elapsed, returned to critical status due to xenon decay.

C. The reactor should not be shutdown, but will be shutdown before 12 hours have elapsed due to xenon decay.

D. The reactor should not be shutdown and will be at a higher power after 12 hours due to xenon decay.

24.0

An electrical transient has caused the "A" RPS MG set to trip. Which of the following is the cause:

A. Lockout of bus A-3

B. Slow transfer of bus B-6

C. "A" diesel generator load shed

D. Fault on bus B-10

25.0

A reactor low water level scram has occurred. Given the following plant conditions:

Rx power	75 on range "3" of the IRMs
Rx mode switch	Startup position
Rx pressure	656 psig
SDV bypass switch	BYPASS position
Rx water level	+10 inches

SELECT the RPS scram signals which are bypassed for the above conditions.

A. APRM setdown, MSIV closure and SDV high water level.

B. TSV closure, RPV low level and IRM "A" upscale coincident with APRM "A" downscale.

C. TSV closure, TCV fast closure and APRM flow biased high flux.

D. IRM HI-HI, SDV high water level and TCV fast closure.

26.0

During a reactor startup, with all IRM channels indicating 80 on range 4, the reactor operator inadvertantly downranges IRM B to range 3.

Select the expected automatic actions, if any.

A. IRM "downscale" annunciator and rodblock.

B. No automatic actions occur.

C. IRM channel "B" inop trip and rod block.

D. IRM B "Hi" annunciator, rod block and RPS channel "B" trip.

27.0

The reactor is operating at 100% power. The status of "B" APRM is as follows:

Level A	3 of 3 LPRM inputs operable
Level B	2 of 3 LPRM inputs operable
Level C	3 of 4 LPRM inputs operable
Level D	4 of 4 LPRM inputs operable

At this time, another level B input fails downscale. The effect on "B" APRM is:

A. "B" APRM generates an INOP trip and is declared Administratively INOP as well.

B. "B" APRM does not generate an INOP trip, but is declared Administratively INOP.

C. "B" APRM generates an INOP trip, but is not Administratively INOP.

D. "B" APRM does NOT generate an INOP trip and is NOT declared Administratively INOP.

28.0

Describe the effect of instrument line rupture and elevated drywell temperatures on RPV narrow range level readings.

A. Reference leg rupture and DW high temperature both result in HIGHER instrument readings.

B. Reference leg rupture and DW high temperature both result in LOWER instrument readings.

C. Variable leg rupture and DW high temperatures both result in HIGHER instrument readings.

D. Variable leg rupture and DW high temperatures both result in LOWER instrument readings.

29.0

During a reactor startup, the operator closes the reactor head vents and observes the FWLC instruments indicate 25 inches and are rising. As the operator maintains level (on FWLC instruments), he notes that the narrow range instruments are lowering. The most probable cause of this event is:

A. The narrow range instruments have not been properly calibrated.

B. This is expected since the FWLC instruments are calibrated at different conditions than the narrow range instruments.

C. Non-condensable gases are present in the FWLC reference leg and have collapsed as reactor pressure increased.

D. Narrow range level instruments have been inadvertently valved out of service.

30.0

PNPS is at 100% power when a loss of feedwater event occurs causing reactor water level to decrease to negative 65 inches. HPCI fails to initiate, RCIC does automatically initiate and reactor water level is now increasing. SELECT the statement which describes the automatic RCIC system response if no operator action is taken.

A. At +45 inches a RCIC isolation signal is generated. The isolation will automatically clear at negative 46 inches and decreasing and RCIC injection will commence.

B. At +45 inches a RCIC turbine trip signal is generated. The turbine trip will automatically clear at +45 inches and decreasing and RCIC injection will not commence until -46 and decreasing.

C. At +45 inches a RCIC turbine trip signal is generated. The turbine trip will automatically clear at negative 46 inches and decreasing and RCIC injection will commence.

D. At +45 inches the RCIC steam supply valve shuts. The valve will automatically reopen at negative 46 inches and decreasing and RCIC injection will commence.

31.0

ADS has actuated due to a loss of coolant accident. The following conditions exist:

- Reactor Pressure: 900 psig
- Drywell Pressure: 12 psig
- RPV Level: -60 inches
- "A" RHR pump is providing torus sprays; all other low pressure ECCS pumps are not operating.
- All 4 SRV's are open due to the automatic ADS actuation.

While shifting "A" RHR to drywell sprays, the operator accidently trips the "A" RHR pump. The expected response of the ADS system is:

A. The ADS blowdown will continue.

B. All four SRV's will close.

C. All 4 SRV's will close after a two minute delay.

D. All four SRV's will close then reopen after a two minute time delay.

32.0

The current plant conditions include annunciators 903L-A1, ADS Power Failure and C3RC-A7, A 125 VDC undervoltage. The effect that this has on the ADS system is:

A. ADS will NOT automatically initiate due to loss of logic power, but all four SRVs can still be opened manually.

B. ADS will automatically initiate if required but only the B&D SRVs will open.

C. ADS will NOT automatically initiate and only the B&D SRVs can be opened manually.

D. ADS will automatically initiate if required and all four SRVs will still open.

33.0

The plant was at 100% power. A small steam leak occured which caused drywell pressure to increase to 3.0 psig. The reactor scrammed. During the resulting transient, reactor water level decreased to +5 inches before being restored to the normal band. WHICH ONE of the following lists the primary containment isolation system (PCIS) isolations that should have occurred?

A. Group 1 (MSIV) and Group 2 (primary containment).

B. Group 2 (primary containment) and Group 6 (reactor water cleanup).

C. Group 4 (high pressure coolant injection) and Group 5 (reactor core isolation cooling).

D. Group 3 (shutdown cooling) and Group 4 (high pressure coolant injection).

34.0

The reactor has scrammed, water level is +8" and rising slowly. Reactor building ventilation supply & exhaust fans are operating. RCIC is in standby readiness. After verifying automatic actuations, you should:

A. Depress RCIC initiation pushbutton.

B. Start Standby Gas Treatment System "A".

C. Place RBIS LOGIC TEST/TRIP switches into the ISOLATE position.

D. No operator actions are required, all systems are functioning normally.

35.0

A reactor startup is in progress. The following conditions exist:

Mode Switch in RUN
Reactor power 8% (Average APRM)
Reactor pressure 930 psig
Reactor water level 30 inches

A malfunction in the Mechanical Hydraulic Control System causes ALL turbine bypass valves to fully open.

SELECT the AUTOMATIC plant response.

A. MSIV closure on High Main Steam Line Flow AND Reactor Scram on RPV Low Level.

B. MSIV closure on High Main Steam Line Flow AND Reactor Scram on High Reactor Pressure on High APRM Flux.

C. MSIV closure on Low Main Steam Line Pressure AND Reactor Scram on MSIV closure.

D. MSIV closure on Low Main Steam Line Pressure AND Reactor Scram on High Reactor Pressure or High APRM Flux.

36.0

While at 90% power, an SRV opens. Which statement is correct concerning indicated steam flow and RPV level.

A. Steam flow decreases, RPV level decreases.

B. Steam flow decreases, RPV level increases.

C. Steam flow increases, RPV level decreases.

D. Steam flow increases, RPV level increases.

37.0

The feedwater level control system is operating in single element control with one feedwater regulating valve in master auto control. (Reactor power is approximately 30%). The second feedwater regulating valve is being placed in service. The operator slowly opens the second feedwater valve with its manual knob until its demand is equal to the first valve. During the time the second feedwater regulating valve is being opened, the affect on the first valve is:

A. The demand signal on the first valve will remain the same. As the second valve is opened, reactor water level will increase above the level setpoint. The operator will compensate for this by throttling the first valve closed.

B. The demand signal on the first valve will decrease. As the second valve is opened, reactor water level will increase above the level setpoint. The FWLC system will automatically compensate for this by throttling the first valve closed.

C. Initially, the demand signal for the first valve will increase because the FWLC system will sense a feed flow/steam flow mismatch. Once the mismatch is corrected, the demand signal will stabilize.

D. The first valve demand signal will decrease as the second valve is opened due to a built-in bias in the controllers.

38.0

Train "A" of the Standby Gas Treatment System has been taken out of service due to an inoperable fan. According to the system procedure, the control switch for the "B" Standby Gas Treatment System fan is taken from "STANDBY" to "MAINTENANCE". SELECT the statement that describes the reason for this action.

A. The "A" train inlet and outlet damper will not open upon receipt of a system initiation signal.

B. The cross-connect dampers between the filter trains are shut to isolate the "A" train following system initiation.

C. The "B" train is prevented from shutting down after a 65 second time delay following system initiation.

D. The "B" train is prevented from shutting down on low-flow for 10-15 seconds following system initiation.

39.0

After an operator locally investigates "A" diesel generator, it's reported that the diesel overcrank annunciator is present. Which of the following could cause this condition to exist?

A. Lube oil high temperature shutdown.

B. Jacket water high temperature shutdown.

C. Emergency stop switch is OFF.

D. Fuel oil filters are clogged.

40.0

With the reactor at 100% power, WHICH ONE of the following conditions could cause a control rod to drift OUT?

A. DCV 120 fails open (settle/direction control valve).

B. CRD drive water pressure control valve closes (302-8)

C. Collet fingers stuck out.

D. Buffer piston clogged.

41.0

Reactor startup is in progress. Control rod 12-24 is being withdrawn to position 24 when a rod worth minimizer (RWM) withdraw block alarm is received; the rod settles to position 26. WHICH ONE of the following control rod manipulations is possible?

A. Insert control rod 12-24.

B. Select a control rod in a different group.

C. Select a different rod in this latched group and insert it one notch.

D. Select a different rod in this latched group and withdraw it one notch.

42.0

The plant is operating at 70% with only "A" reactor recirculation pump running. Which ONE of the following conditions represents the plant status?

A. "B" jet pump flow is reverse, indicated core flow is the same as actual core flow.

B. "B" jet pump flow is reverse, indicated core flow is greater than actual core flow.

C. "B" jet pump flow is forward, indicated core flow is the same as actual core flow.

D. "B" jet pump flow is forward, indicated core flow is greater than actual core flow.

43.0

WHICH ONE of the following contains ONLY signals that will shut Reactor Water Cleanup Valve MO-2, RWCU Supply Inboard Isolation?

A. Non-Regenerative Heat Exchangers inlet temperature at 150 degrees F, Activation of the Standby Liquid Control System, RWCU Area Ambient Temperature at 200 degrees F.

B. Activation of the Standby Liquid Control System, RWCU Area Ambient Temperature at 200 degrees F, Non-Regenerative Heat Exchanger outlet temperature of 150 degrees F.

C. RWCU Area Ambient Temperature at 200 degrees F, RWCU inlet flow 200% of rated, Non-Regenerative Heat Exchanger outlet temperature of 150 degrees F.

D. Non-Regenerative Heat Exchanger outlet temperature of 150 degrees F, Activation of the Standby Liquid Control System, RWCU inlet flow 200% of rated.

44.0

While withdrawing a control rod at 90% power, the "B" APRM fails downscale. Which one of the following describes the effect on the "B" Rod Block Monitor with no operator action:

A. The upscale trip setpoint will be increased and the "D" APRM will automatically engage as the reference APRM.

B. The upscale trip setpoint will decrease and the "B" APRM will remain engaged as the reference APRM.

C. The RBM will be automatically bypassed and the "D" APRM will automatically engage as the reference APRM.

D. The RBM will be automatically bypassed and the "B" APRM will remain engaged as the reference APRM.

45.0

The direction has been given to initiate torus sprays. WHICH ONE of the following describes a line-up which assures that design limits are met for 1) adequate torus sprays and 2) residual heat removal (RHR) equipment operation?

A. RHR pump "A" is running, the heat exchanger bypass valve (MO-1001-16A) is closed and the heat exchanger flow is 4850 gpm.

B. RHR pump "A" is running, the heat exchanger bypass valve (MO-1001-16A) is open and the heat exchanger flow is 3350 gpm.

C. RHR pumps "A" and "C" are running, the heat exchanger bypass valve (MO-1001-16A) is closed and the heat exchanger flow is 6150 gpm.

D. RHR pumps "A" and "C" are running, the heat exchanger bypass valve (MO-1001-16A) is open and the heat exchanger flow is 5050 gpm.

46.0

A control rod is being withdrawn from notch position 24 to notch position 26. During withdrawal, the odd numbered reed switch sticks closed. Which ONE of the following alarms is received?

A. ROD DRIFT

B. RPIS INOP

C. RWM ROD BLK

D. ROD SEL BLK TIMR MALF

47.0

WHICH ONE of the following describes the power supply configuration of the Inboard and Outboard MSIV solenoids?

A. Both Inboard MSIV solenoids are powered from RPS 120 VAC.

B. Both Outboard MSIV solenoids are powered from 125 volt DC bus A or B.

C. The Inboard MSIVs have one solenoid powered from RPS 120 VAC AND one solenoids powered from 125 volt DC bus A or B.

D. The Outboard MSIVs have one solenoid powered from 120 safeguards VAC bus A or B AND one solenoid powered from 125 Volt DC bus A or B.

48.0

A loss of coolant (LOCA) has occurred in conjunction with a failure of off-site power. WHICH ONE of the following states the sequence of equipment automatically started after both emergency diesel generators start?

A. The first two residual heat removal (RHR) pumps, then the core spray pumps, then the turbine building closed cooling water (TBCCW) pump "A", then the second two RHR pumps, then the salt service water (SSW) pump "A".

B. The first two RHR pumps, then the second two RHR pumps, then the core spray pumps, then the TBCCW pump "A" and the SSW "A" pump.

C. Core spray pumps, then the first two RHR pumps, then the second two RHR pumps, then the TBCCW pump "A" and the SSW "A" pump.

D. Core spray pumps, then the first two RHR pumps, then the SSW "A" pump, then the second two RHR pumps, then the TBCCW pump "A".

49.0

WHICH ONE of the following describes the effect of a mechanical failure of the vital bus motor generator set?

A. Power to the vital bus loads is lost; manual switching is required to resupply power to the vital bus from bus 15.

B. Power to the vital bus loads is lost; manual switching is required to resupply power to the vital bus from bus 14.

C. Power to the vital bus loads is restored; automatic switching supplies power to the vital bus from bus 14.

D. Power to the vital bus loads is restored; automatic switching supplies power to the vital bus from bus 15.

50.0

The control room auto transfer switches for all six (6) 4kV buses "A1" through "A6" are left in the OFF position. A reactor scram occurs. WHICH ONE of the following buses will be powered 30 seconds after the scram? ASSUME no operator actions are taken.

A. "A1"

B. "A2"

C. "A4"

D. "A5"

51.0

The plant is at 50% power with all 4160 VAC buses fed from the UAT. The "A" EDG is undergoing a full load test. While fully loaded, the operator inadvertantly shifts the TEST/NORMAL switch from TEST to NORMAL. Which of the following will be the response of the UAT feeder and EDG feeder breaker to the bus?

A. UAT feeder breaker remains closed, the EDG feeder breaker remains closed.

B. UAT feeder breaker remains closed, the EDG feeder breaker trips open.

C. UAT feeder breaker trips open, the EDG feeder breaker remains closed.

D. UAT feeder breaker trips open, the EDG feeder breaker trips open.

52.0

WHICH ONE of the following would explain why both recirculation MG sets tripped and the following alarms are received: "Annunciator Power Fail" and "Alarm System Power Fail"?

A. Loss of 125 VDC bus D-4.

B. Loss of 125 VDC bus D-5.

C. Loss of 125 VDC panel D-6.

D. Loss of 250 VDC safeguard MCC B-14.

53.0

PNPS is starting up at 3% power when a main steam line radiation increases to 4 times normal background level.

Select the automatic trip signals that should have occurred.

A. Group 1 Isolation and mechanical vacuum pump trip.

B. Group 1 isolation and no mechanical vacuum pump trip.

C. No Group 1 isolation and a mechanical vacuum pump trip.

D. No Group 1 isolation and no mechanical vacuum pump trip.

54.0

WHICH ONE of the following completes the statement below?

Concerning the HVAC system, the interlock that ensures reactor building pressure is maintained is ______ (1) ______ and if instrument air were lost all the air operated dampers would fail ______ (2) ______.

A. (1) starting a supply fan before starting an exhaust fan
   (2) shut

B. (1) starting an exhaust fan before starting a supply fan
   (2) open

C. (1) starting a supply fan before starting an exhaust fan
   (2) open

D. (1) starting an exhaust fan before starting a supply fan
   (2) shut

55.0

WHICH ONE of the following will automatically start the control room High Efficiency Air Filtration System when its control switch is in AUTO?

A. High control room temperature.

B. Halon injecting into the cable spreading room.

C. Humidity greater than 70% in the control room.

D. Low flow condition sensed by the fan that is in STANDBY.

56.0

During a loss of all SSW pumps, the last condensate pump is kept running:

A. until the vapor valves are shut.

B. until the turbine has tripped.

C. until the MSIVs are shut.

D. to maintain CRD pump suction pressure until the rods have inserted.

57.0

The unit is operating at 100% reactor power and experiences a problem with the main generator. The operating crew reduces load to 14,800 amps in 90 seconds.

"A" Stator Water Cooling Pump	Running
"B" Stator Water Cooling Pump	Running
Stator Cooling Outlet Temperature	82 Degrees Celius
Stator Cooling Water Inlet Pressure	51 psig

With no additional operator actions:

A. The generator will trip in 30 seconds due to generator amps.

B. The generator will trip in 30 seconds due to stator water inlet pressure.

C. The generator will trip in 4 minutes due to stator water outlet temperature.

D. The generator will continue to run.

58.0

RHR Pump "A" is operating in the Shutdown Cooling Mode. RPV level momentarily drops to 0 inches before recovering.

SELECT the RHR System response.

A. MO-1001-47 and MO-1001-50 valves remain open and MO-1001-29 valve closes.

B. MO-1001-47 and MO-1001-50 valves remain open and MO-1001-29 valve remains open.

C. MO-1001-47 and MO-1001-50 valves close and MO-1001-29 valve remains open.

D. MO-1001-47 and MO-1001-50 valves close and MO-1001-29 valve closes.

59.0

During startup from a refueling outage, reactor power is 5%, the reactor building operator reports the following conditions:

Spent Fuel Pool Temp. - 100°F, rising slowly
Skimmer Surge Tank Level - Full
Fuel Pool Cooling Pump A - On, B - Off

The required response to the above conditions is to:

A. These conditions are normal and do not require any additional actions.

B. Stop the reactor startup until fuel pool temperature is stabilized.

C. Align the RHR system to augmented fuel pool cooling mode.

D. Provide feed and bleed path using the makeup to the skimmer surge tank and drain to radwaste.

60.0

The reactor is at 100% power when the following conditions are noted. Conditions from the last hour are given. Conditions are now stable.

	T = 0	T = 60 Minutes
Recirc Pump A Speed	69.6%	69.9%
Recirc Pump B Speed	70.1%	70.1%
Total Core Flow	55 Mlb/hr.	44 Mlb/hr.
Reactor Power	100%	85%
Loop Flow A	35000 gpm	37000 gpm
Loop Flow B	35000 gpm	48000 gpm

Select the statement that best describes plant conditions at T = 60 Minutes:

A. A trip of the "A" recirc pump field breaker has occurred.

B. A jet pump failure has occurred on the "B" recirc loop.

C. A jet pump failure has occurred on the "A" recirc loop.

D. A scoop tube runaway has occurred on the "B" recirc loop.

61.0

Given the following:

Reactor Power	80%
Total Core Flow	48.3 Mlb/hr.
'A' Recirc Loop Flow	62%
'B' Recirc Loop Flow	58%

What is the scram setpoint of APRM E?

A. 102.6

B. 97.96

C. 96.8

D. 95.64

62.0

A control rod blade for cell 20-31 was replaced during the outage. The blade is fully withdrawn with RPIS fully restored. Which one of the following will occur when loading of new fuel from the fuel pool to the core begins:

A. Fuel cannot be positioned over the core.

B. Be positioned over any core location and lowered.

C. Be positioned over any core location and be lowered to any location except that one.

D. Be positioned over the core but not lowered.

63.0

Which one of the following is correct as per the Immediate Operator actions of PNPS 2.4.37, Turbine Control System Malfunctions?

A. If reactor pressure is decreasing OR oscillating, reduce core flow.

B. If reactor pressure is decreasing OR oscillating, secure the EPR switch to the OFF position.

C. If reactor pressure is increasing OR oscillating, reduce core flow.

D. If reactor pressure is increasing OR oscillating, secure the EPR switch to the OFF position.

64.0

Which of the following scram signals are always available to generate a scram signal, regardless of plant conditions?

A. Turbine Stop Valve Fast Closure.

B. IRM High High.

C. Reactor Hi Pressure.

D. Main Steam Line Valve Closure.

65.0

While operating at 100% power, a feedwater control system malfunction causes reactor water level to decrease to +18 inches (and lowering). The reactor continues to operate at 100% power.

WHICH ONE of the following is a required immediate operator action?

A. Manually initiate a reactor scram.

B. Reduce reactor power as necessary to maintain level.

C. Depress FRV lockup reset and place FRV controllers in manual.

D. Shift the feedwater control system from 3 element to 1 element control and allow it to restore level automatically.

66.0

The following conditions exist after a loss of off-site power:

Reactor power	0%
Reactor pressure	940 psig, steady
Reactor level	25 inches, steady
Torus temperature	87°F, rising
Drywell pressure	2.7 psig, steady

The operator is ordered to maximize torus cooling and drywell cooling. Which statement is correct regarding the RHR system when all actions have been performed?

A. RBCCW temperature setpoint is at 70°F, RHR pumps A and C are running, 1001-16A and 1001-16B (RHR heat exchanger bypass valves) are partially shut, 1001-19 is open.

B. RHR pump B and C are running, 1001-16A and 16B (RHR heat exchanger bypass valves) are shut, 1001-19 is open.

C. RHR pump A and D are running, 1001-16A and 16B (RHR heat exchanger bypass valves) are fully open, 1001-19 is open.

D. RHR pumps B and D are running, 1001-16A and 16B (RHR heat exchanger bypass valves) are shut, 1001-19 is shut.

67.0

Given an ATWS, WHICH ONE of the following methods for inserting control rods requires the SDIVs to be drained?

A. Individual scram test switches.

B. Insert control rods by increasing cooling water differential pressure.

C. Maximizing drive water pressure for control rod insertion.

D. Venting the overpiston area of the control rod drives.

68.0

There is a reactor scram and the following events occur:

Level decreases to +3 inches and then increases to +30 inches
Two control rods stay at position 48 and the others all insert to 00
All other parameters and conditions are normal

Which one of the following is the correct course of action?

A. Enter both EOP-01 and EOP-02 and perform them concurrently. EOP-02 directs you to the alternate rod insertion procedure, 5.3.23, alternate rod insertion, to insert the rods.

B. Enter EOP-02 directly, which directs you to the scram procedure, 2.1.6, which directs you to the alternate rod insertion procedure, 5.3.23, to insert the rods.

C. Enter EOP-01, which directs you to EOP-02, which directs you to the alternate rod insertion procedure, 5.3.23, to insert the rods.

D. Enter EOP-01, which directs you to the scram procedure, 2.1.6, which directs you to use the alternate rod insertion procedure, 5.3.23, to insert the rods.

69.0

EOP-03, "Primary Containment Control", directs the operator to secure torus sprays when torus pressure drops below 2.2 psig. SELECT the bases for this procedure step.

A. Prevents increasing water level in the torus and the lowering level in downcomers.

B. Prevents operation of the reactor building to torus vacuum breakers from deinerting the containment.

C. Prevents failure of containment due to external pressure.

D. Allows reset of the containment isolation logic.

70.0

Following an accident, narrow range torus pressure indication is pegged high. Additionally, the drywell-to-torus differential pressure indicator has failed. In order to determine the proper course of actions to take per the EOP's, the supervisor asks you to calculate torus air space pressure. Other plant indications are as follows:

Torus Bottom Pressure
- PI-1001-69A = 21 psig
- PI-1001-69B = 21 psig

Torus Level
- LI-1001-604A = 150 in.
- LI-1001-604B = 150 in.

Which of the following most accurately reflects torus air space pressure for these conditions?

A. 13 - 13.99

B. 14 - 14.99

C. 15 - 15.99

D. 16 - 16.99

71.0

Current conditions of the reactor require that boron be injected into the vessel per EOP-02, "Failure to Scram". WHICH ONE of the following DOES NOT describe the basis for inhibiting ADS immediately before boron injection?

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

B. To prevent a rapid injection of cold, unborated water resulting in a rapid increase in power.

C. To prevent rapid cooldown during depressurization resulting in a reactivity excursion.

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

72.0

After a low low RPV level automatic actuation, the operator placed the controller in manual and injected at 2000 gpm. HPCI subsequently tripped on high RPV water level. RPV level is now negative 30 inches and lowering. Which of the following statements is correct:

A. HPCI will automatically inject at -46 inches at a rate of 4000 gpm.

B. HPCI will automatically inject at -46 inches at a rate of 2000 gpm.

C. HPCI will not automatically inject even if level reaches -46.

D. HPCI will trip on overspeed because the throttle valve is not fully closed.

73.0

During an ATWS with a 2.2 psig high drywell signal present, the NOS orders the operator to "stop and prevent" injection from all systems except boron and CRD. AFTER these actions are taken, which statement best describes the status of the RCIC and Core Spray Systems:

A. RCIC is tripped, core spray is in pull-to-lock.

B. RCIC is isolated, core spray is in pull-to-lock.

C. RCIC is tripped, core spray is running.

D. RCIC is isolated, core spray is in pull-to-lock.

74.0

WHICH ONE of the following is the basis for the action in EOP-01, "RPV Control", which directs that reactor pressure vessel pressure be controlled below 1085 psig with safety relief valves (SRVs) IF any SRVs are cycling?

A. Controls RPV pressure to within the capability of high pressure injection systems to inject.

B. Controls RPV pressure below the lowest SRV lift pressure.

C. Prevents RPV damage due to cyclic loading.

D. Minimizes damage due to hydrodynamic loading in the torus.

75.0

The plant is operating at 84% power with core flow at 49 Mlb/hr. when a loss of feedwater heating occurs. Which of the following actions are required:

A. Reduce power with recirc flow to 75% power.

B. Reduce power with recirc flow to 59% power.

C. Reduce core flow to 36 Mlb/hr., no further control rod motion is required.

D. Reduce core flow to 36 Mlb/hr. and insert control rods to 59% power.

76.0

While operating at 100% power on the 118% rod line, both reactor recirculation pumps trip. Assume the reactor does not scram and ignore outside effects.

Using the power-to-flow map, select the total reactor core flow (post-trip).

A. 20.6 Mlb/hr.

B. 24.5 Mlb/hr.

C. 27.5 Mlb/hr.

D. 34.5 Mlb/hr.

77.0

The plant was operating at 100% power on the MELLLA rod pattern on the 116% rod line when the "A" recirc MG tripped.

Select the correct valve for total actual core flow from the following indications:

Loop A Flow	6 Mlb/hr.	Pump A Speed 0%
Loop B Flow	42.5 Mlb/hr.	Pump B Speed 80%
Rx Power	75%	

A. 36.5 Mlb/hr. Reverse flow

B. 48.5 Mlb/hr. Reverse flow

C. 36.5 Mlb/hr. Forward flow

D. 48.5 Mlb/hr. Forward flow

78.0

While at 90% power condenser vacuum is observed to be decreasing. WHICH ONE of the following plant responses would occur if vacuum further decreases without operator action?

A. The turbine will trip at 22" Hg vacuum which will cause a reactor scram.

B. The turbine will trip at 26" Hg vacuum in a reactor scram.

C. The turbine will trip after the reactor scrams at 26" Hg vacuum.

D. The turbine will trip after the reactor scrams at 22" Hg vacuum.

79.0

The following conditions exist:

EDG "A" on bus A-5, sharing with the UAT
EDG "B" on bus A-6, sharing with the SUT
All fast transfer switches are "ON"

The reactor scrams on a +2.2 psi high drywell pressure signal. What is the final status of the electrical distribution system?

A. A-5 and A-6 are on the SUT.

B. A-5 is being powered by the SUT.
A-6 is being powered by the EDG in Isoch. Mode.

C. A-5 and A-6 are on the EDGs in Isoch. Mode.

D. A-5 is being powered by EDG "A" in Isoch.
A-6 is being powered by the SUT.

80.0

A loss of offsite power occurs. Bus A-5 is being powered by the Station Blackout Diesel. Bus A-6 is being powered by "B" EDG. Drywell pressure is 2.9 psi. Regarding the high pressure instrument air system:

A. No compressors are running due to lack of power to A-1 through A-4.

B. K-104C is running but cannot maintain air pressure >85 psig.

C. K-104C is running with air pressure being maintained >85 psig.

D. No compressors are running due to loss of power and load shedding.

81.0

Given the following conditions after the high drywell pressure scram:

RFP A, B, C	Tripped
RPV Level	+55 inches, lowering
Drywell Pressure	1.9 psig, lowering
Drywell Temperature	110°F, lowering
Drywell Humidity	3%, steady
HPCI Turbine Speed	0 RPM

The HPCI System status in response to these conditions is:

A. Valve 2301-3 is open, the aux oil pump is on.

B. Valve 2301-3 is closed, the aux oil pump is on.

C. Valve 2301-3 is open, the aux oil pump is off.

D. Valve 2301-3 is closed, the aux oil pump is off.

82.0

A Plant shutdown is in progress with reactor power at 50% when all drywell coolers are lost and CANNOT be restored. Within several minutes, entry into the Emergency Operating Procedures (EOP) will be required. WHICH ONE of the following states the EOP(s) that will have to be entered within the next several minutes? (Assume no other malfunctions).

A. EOP-01 (RPV Control) ONLY.

B. EOP-01 and EOP-04 (Secondary Containment Control).

C. EOP-01, EOP-02 (Failure to Scram) and EOP-03 (Primary Containment Control).

D. EOP-01, and EOP-03.

83.0

SELECT the IMMEDIATE operator action in the event the main control room becomes uninhabitable.

A. Trip the main turbine.

B. Ensure all control rods are inserted.

C. Manually initiate RCIC.

D. Announce the event over the station paging system.

84.0

For the following plant symptoms, select the actions required.

- "A" RBCCW surge tank low level alarm
- "A" RBCCW discharge pressure low
- RBCCW loop "A" pressure 35 psig and decreasing

A. Supply service water to RBCCW loads which service water can supply and commence a controlled reactor shutdown.

B. Isolate large heat loads and commence a controlled reactor shutdown.

C. Reduce reactor power to maintain equipment temperatures within limits.

D. Isolate the drywell cooling loops, manually run recirc. pumps to minimum speed, then place the reactor mode switch to shutdown.

85.0

Which of the following components will not be cooled if RBCCW loop A is not in service?

A. HPCI pump area cooling coil B.

B. Recirc MG set fluid coupling oil and bearing coolers.

C. VAC 205A DW air cooling coil.

D. Clean up demin non-regenerative heat exchanger.

86.0

Which of the following conditions will cause a loss of cooling to the drywell coolers?

A. SSW loop selector switch is in "Loop A" and a loss of bus B-1 occurs.

B. SSW loop selector switch is in "Loop B" and a loss of bus B-1 occurs.

C. SSW loop selector switch is in "Loop A" and a loss of bus B-2 occurs.

D. SSW loop selector switch is in "Loop B" and a loss of bus B-2 occurs.

87.0

At 90% reactor power you recognize the following annunciators are in an alarm condition. Instrument Air pressure indicates a constant 82 psig in the control room.

ALARM	PANEL	WINDOW
Instrument Air Header Pressure Low	C2 Right	A4
Service Air Header Isolated	C2 Right	A5
Standby Compressor Running	C2 Right	C5

WHICH ONE of the following ONLY contains automatic actions that can be associated with these alarms?

A. AO-4365 closes to isolate the non-essential instrument air header, backup K104 air compressor starts, AO-4353 closes to isolate instrument air from low pressure service air if it is open.

B. Backup K104 air compressor starts, AO-4353 closes to isolate instrument air from low pressure service air if it is open, AO-4350 closes to isolate the service air header.

C. AO-4353 closes to isolate instrument air from low pressure service air if it is open, AO-4350 closes to isolate the service air header, AO-4365 closes to isolate the non-essential instrument air header.

D. Backup K104 air compressor starts, AO-4350 closes to isolate the service air header, AO-4365 closes to isolate the non-essential instrument air header.

88.0

While operating at full power, both CRD pumps are lost.

Which ONE of the following correctly describes conditions for which the operator is required to place the mode switch in shutdown?

A. After 20 minutes if unable to start a CRD pump.

B. When any control rod starts drifting in.

C. When more than two control rod high temperature alarms are received per nine rod square array.

D. When more than one CRD accumulator low pressure alarm occurs per nine rod square array.

89.0

EOP-03, "Primary Containment Control", directs the operators to trip HPCI if torus level cannot be maintained >95". HPCI operation must be terminated:

A. Due to HPCI pump NPSH considerations.

B. To prevent the HPCI exhaust rupture disc from becoming a pathway outside containment.

C. To prevent the pressurization of the torus air space.

D. To maintain capability to vent the containment.

90.0

A steam leak in the drywell results in entry to the EOPs. A drywell temperature of 350(F has resulted in entry to EOP-17 and depressurization of the RPV to 80 psig. With drywell temperature at 350(F, RPV pressure at 80 psig, and drywell pressure at 5 psig RPV level indications are operating erratically. Which one of the following actions should be taken?

A. Spray the drywell.

B. Vent the drywell.

C. Flood the RPV.

D. Continue with cooldown.

will provide caution / only to applicants

91.0

A Main Stack Hi-Hi Radiation alarm has annunciated. Which statement below best describes the automatic actions which occur:

A. The main stack isolation valve shuts after 15 minutes if the alarm does not clear.

B. The off-gas timer initiates and will isolate the flowpath if the trip unit is not reset.

C. An RBIS signal is generated to prevent the potential release.

D. No automatic actions occur for this condition.

92.0

Emergency Operating Procedure EOP-05, "Radioactivity Release Control", directs the operator to isolate systems discharging into secondary containment except those required to shutdown the reactor. Select the basis for this statement.

A. Isolating these systems results in inadequate core cooling.

B. Isolating these systems results in no increase of off-site releases from the discharge of these systems.

C. Isolating these systems results in the thermal degradation of safety systems due to higher energy released into primary and secondary containment.

D. Isolating these systems results in potentially higher off-site dose rates.

93.0

Shutdown cooling is in service with head vents open. SDC is subsequently lost. Which of the actions should the operator take:

A. Maintain level at 50" on LI-263-1001 (Rx shutdown level)

B. Maintain level at 41" on LI-263-1001

C. Maintain level at 50" on LI-263-100A/B (Rx water level narrcw range)

D. Maintain level at 41" on LI-263-100A/B

94.0

A report has been received that there is a primary system leak in the reactor building. Which of the following conditions cause you to enter EOP-04?

A. The floor in the HPCI room has 6" of water on it. The HPCI turbine area temperature is 120 degrees F and the HPCI H&V cooler temperature is 90 degrees F.

B. The floor in the CRD quad has 0.75" of water on it. CRD pump room rad levels are 12 mR/hr. CRD H&V temperature is 78 degrees F.

C. The floor in the RCIC room is dry. The rad level is 1 mR/hr and H&V temperatures are 7l degrees F.

D. No observable water on the floor of SE quadrant. Area temperature is 89 degrees F and H&V cooler temperature is 87 degrees F.

95.0

A high secondary containment temperature exists. The NOS directs isolation of all primary systems penetrating the secondary containment. A "primary system" is one which:

A. has primary coolant flowing through it and does not have automatic isolation capability.

B. connects to the RPV, such that a reduction in RPV pressure will increase injection flow from that system.

C. connects directly to the RPV, such that a reduction in RPV pressure could result in a reduced flowrate out of an unisolated break in the system.

D. is contained inside the primary containment such that leaks from a primary system affect the containment parameters.

96.0

WHICH ONE of the following is the reason the plant is scrammed following a LOSS OF ESSENTIAL DC BUS D-6:

A. The reactor is scrammed because the reactor will be operating in the natural circulation mode.

B. The reactor is scrammed because there will be a total loss of control room annunciators.

C. The reactor is scrammed because the inboard MSIV position indication to RPS System will lose power and cause a reactor scram.

D. The reactor is scrammed because a loss of power to turbine controls will cause a reactor scram.

97.0

The plant is operating at power when an inadvertant Group 4 primary containment isolation occurs due to I&C testing. Which of the following is an expected plant response?

A. H_2-O_2 monitor and C-19 isolation valves shut.

B. RWCU system isolation va'ves shut.

C. HPCI system isolation valves shut.

D. RCIC system isolation valves shut.

98.0

An operator reports the following primary containment indications during a plant startup:

DW Pressure:	0.35 psig
Torus Airspace Pressure:	0.30 psig

No DW/Torus Vacuum Breaker Indication for X201 B on Panel C-7
DW/Torus Vacuum Breaker Open 904LC-E1 Alarm

Based on this report:

A. The vacuum breaker is operating correctly and will shut when torus pressure exceeds DW pressure.

B. The vacuum breaker is operating correctly and will shut when DW pressure exceeds torus pressure.

C. The vacuum breaker has lost control power and is open.

D. The vacuum breaker has failed partially open.

99.0

EOP-04 directs if a LOCA exists in primary containment, that certain breakers on bus B-13 be opened. Why are these actions taken?

A. To prevent automatic pumping of the drywell floor and equipment sumps to prevent the spread of possibly contaminated water.

B. To prevent automatic pumping of the reactor building sumps to prevent the spread of possibly contaminated water.

C. To isolate primary systems discharging into the secondary containment.

D. To de-energize electrical equipment that may become damaged by the high containment water level.

100.0

WHICH ONE of the following conditions would cause the diesel generator output breaker to trip automatically while the diesel generator is running due to an automatic start signal?

A. Reverse current.

B. Differential overcurrent.

C. Underfrequency.

D. Unit auxiliary transformer breaker is closed.

NAME: Key

DATE: Nov 22 1995

RO Licensing Exam of November 22, 1995

ANSWER KEY

1.0	D	26.0	D	51.0	B	76.0	A
2.0	C	27.0	B	52.0	C	77.0	A
3.0	D	28.0	A	53.0	C	78.0	A
4.0	C	29.0	C	54.0	D	79.0	D
5.0	B	30.0	D	55.0	B	80.0	D
6.0	B	31.0	A	56.0	C	81.0	A
7.0	D/B	32.0	D	57.0	D	82.0	D
8.0	A	33.0	B	58.0	D	83.0	D
9.0	D	34.0	C	59.0	A	84.0	C
10.0	B	35.0	C	60.0	B	85.0	B
11.0	D	36.0	A/B	61.0	DELETE	86.0	C
12.0	C	37.0	B	62.0	A	87.0	B
13.0	C	38.0	C	63.0	C	88.0	D
14.0	A	39.0	D	64.0	C	89.0	C
15.0	A	40.0	C	65.0	B	90.0	C
16.0	A	41.0	A	66.0	B	91.0	D
17.0	C	42.0	A Typo B	67.0	A	92.0	D
18.0	C DELETE	43.0	B	68.0	C	93.0	A
19.0	A	44.0	D	69.0	B	94.0	A
20.0	D	45.0	A	70.0	C	95.0	C
21.0	D	46.0	A	71.0	D	96.0	A
22.0	D	47.0	D	72.0	B	97.0	C
23.0	A	48.0	C	73.0	A	98.0	D
24.0	A	49.0	D	74.0	B	99.0	B
25.0	C	50.0	D	75.0	D	100.0	B

BOSTON EDISON RTYPE H6.05

PILGRIM NUCLEAR POWER STATION

Procedure 5.3.28

DETERMINING TORUS AIR SPACE PRESSURE USING TORUS BOTTOM PRESSURE FOR EMERGENCY OPERATING PROCEDURES (EOPs)

EOP SUPPORT PROCEDURE CHANGES BY 1.3.4-3 ARE NOT ALLOWED

REQUIRED REVIEWS

STAR

Stop
Think
Act
Review

NESD REVIEW REQUIRED

EOP SUPPORT PROCEDURE

ORC REVIEW REQUIRED/ ~~NOT REQUIRED~~

REVIEWERS AND APPROVERS

Procedure Writer	Date 7/13/94
Technical Reviewer	Date 7-19-94
Validator	Date 7/25/94
Procedure Owner	Date 7/28/94
N/A QAD Manager	Date
ORC Chairman	Date 7/28/94
Responsible Manager	Date 7/28/94

Effective Date: 7/29/94

REVISION LOG

REVISION 2 **Date Originated 6/94**

Pages Affected	Description
4-7	Add LI-1001-604A/B (for reading Torus Wide Range water level). Add PI-1001-69A/B (for reading Torus Bottom Pressure) (plant walkdown - Control Room).

Editorial 1B **Date Originated 12/92**

Pages Affected	Description
2	Add Section 4.0 (References).
2,6	Incorporate current editorial correction identification scheme by placing "A" next to previous editorial correction's rev bars.

Editorial 1A **Date Originated 6/91**

Pages Affected	Description
2,6	Incorporated editorial corrections to Main Control Room Panel Label nomenclature per PDC 87-78C.

REVISION 1 **Date Originated 5/90**

Pages Affected	Description
All	Reformat and Human Factors Review IAW Writers Guide.

<u>TABLE OF CONTENTS</u>

		Page
1.0	PURPOSE AND SCOPE	4
2.0	ACTIONS	4
3.0	DISCUSSION	4
4.0	REFERENCES	4
5.0	ATTACHMENTS	4
ATTACHMENT 1	TORUS AIR SPACE PRESSURE - FIGURE 1	5
ATTACHMENT 2	TORUS BOTTOM PRESS CORRECTION FACTOR/AIR SPACE PRESSURE CALCULATIONS - FIGURE 2	7

1.0 PURPOSE AND SCOPE

This Procedure provides instructions for:

- Determining torus air space pressure graphically using Figure 1.
- Calculating torus air space pressure mathematically using Figure 2.

2.0 ACTIONS

[1] IF torus pressure is required for use in the EOPs, **THEN READ** TORUS BOTTOM PRESS on gauge PI-1001-69A/B on Panel C903 and Torus Wide Range water level on LI-1001-604A/B on Panels C170/171.

(a) **READ** torus air space pressure from the Y-axis of Figure 1.

OR

(b) **COMPLETE** Figure 2 **AND CALCULATE** torus air space pressure.

3.0 DISCUSSION

Actions required in PNPS EOPs based on torus pressure are taken assuming the Operator is using torus air space pressure as the entry parameter. This Procedure gives the Control Room Operator two methods of determining air space pressure given that he knows Torus Bottom Pressure (PI-1001-69A/B on C903) and Torus Wide Range water level (LI-1001-604A/B on C170/171). The first method (Figure 1) is faster than the second (Figure 2) but tends not to be as accurate. The correction factor of 0.036 psi/in. is based on subcooled torus water at 70°F.

4.0 REFERENCES

[1] PNPS Plant Specific Technical Guidelines for EOPs

[2] EOP-3, *"Primary Containment Control"*

[3] EOP-17, *"Alternate Depressurization"*

[4] EOP-27, *"Alternate Depressurization, Failure to Scram"*

5.0 ATTACHMENTS

ATTACHMENT 1 - TORUS AIR SPACE PRESSURE - FIGURE 1

ATTACHMENT 2 - TORUS BOTTOM PRESS CORRECTION FACTOR/AIR SPACE PRESSURE CALCULATIONS - FIGURE 2

TORUS AIR SPACE PRESSURE (NARROW RANGE)

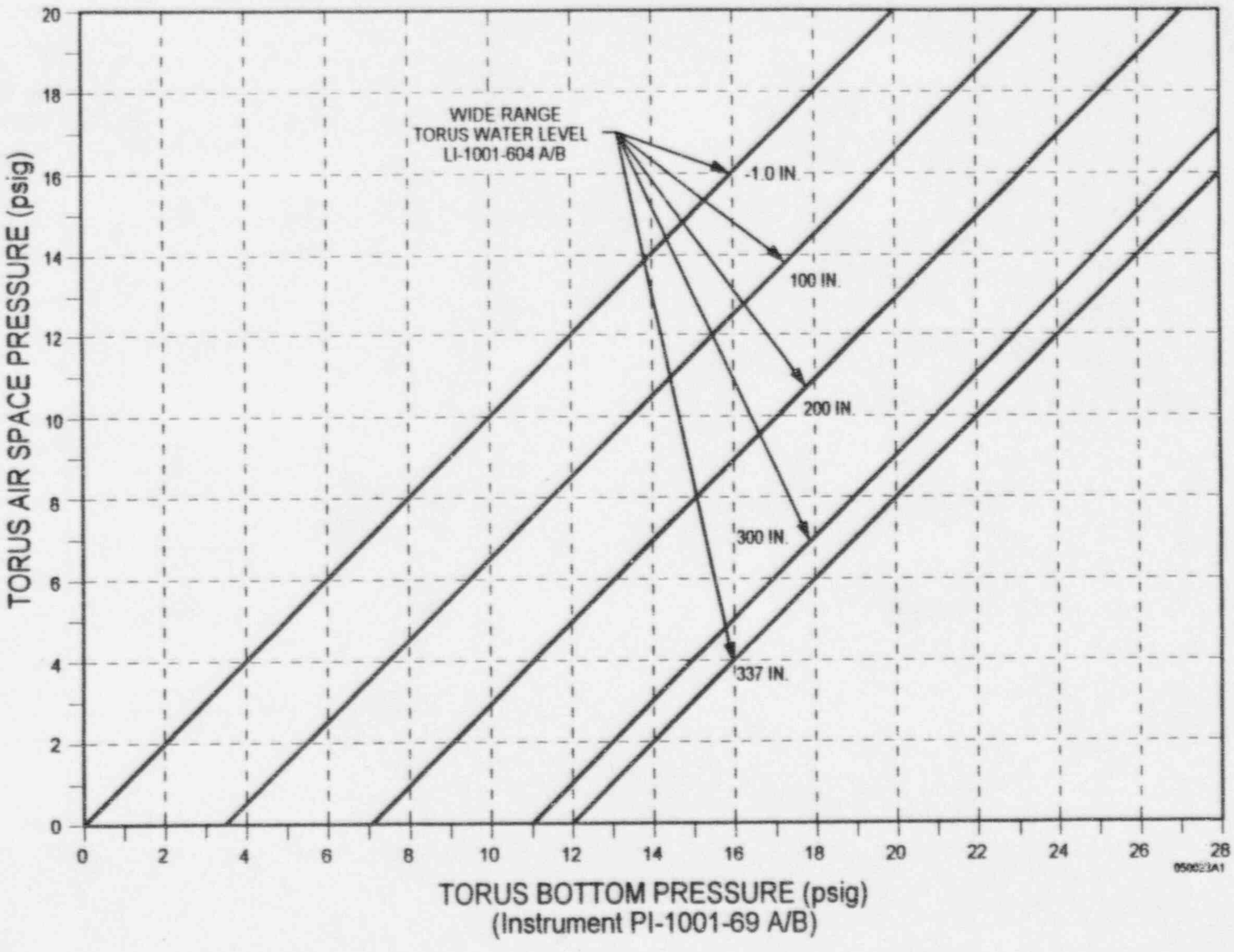


FIGURE 1

TORUS AIR SPACE PRESSURE (WIDE RANGE)

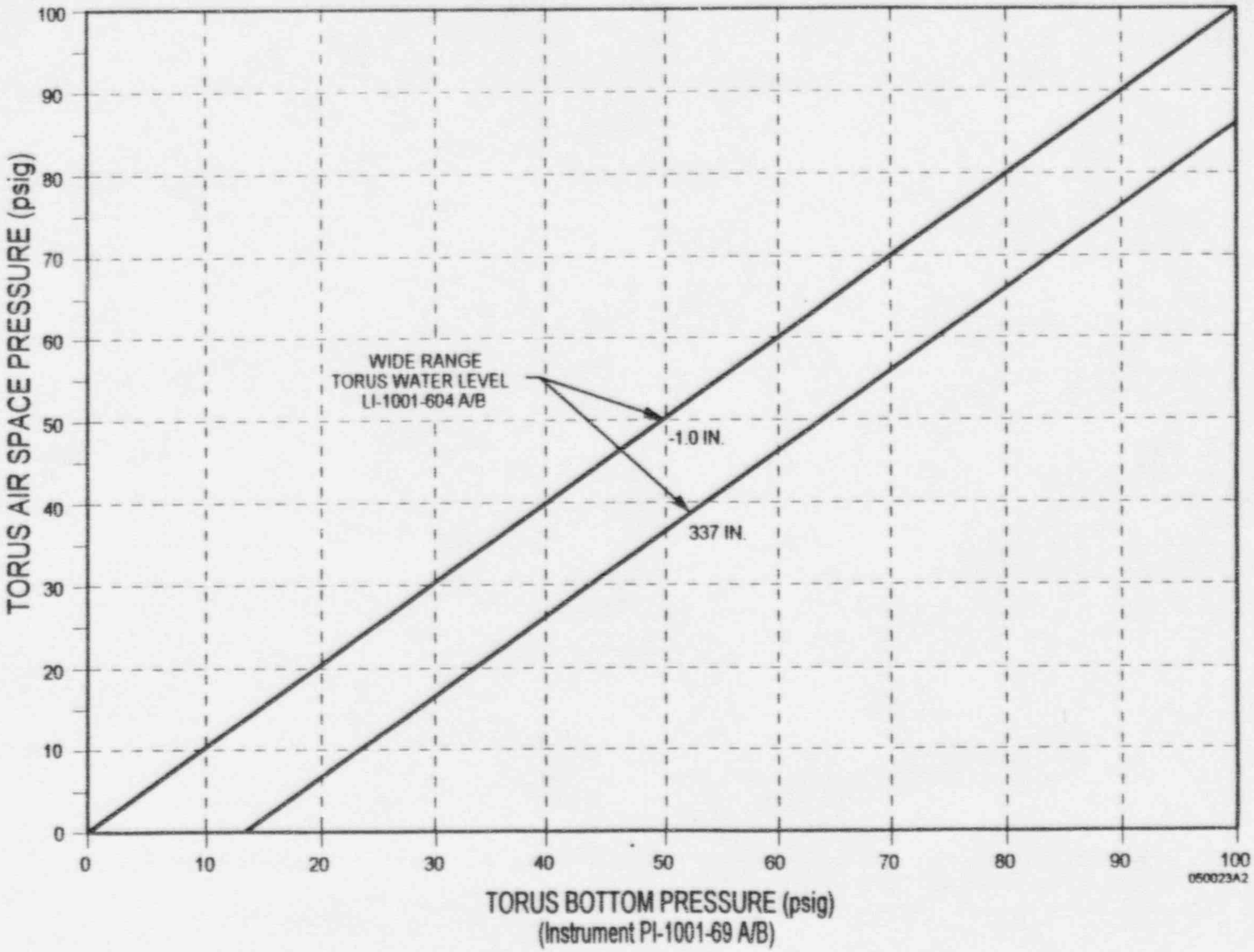


FIGURE 1 (Continued)

TORUS BOTTOM PRESSURE CORRECTION FACTOR/AIR SPACE PRESSURE CALCULATIONS

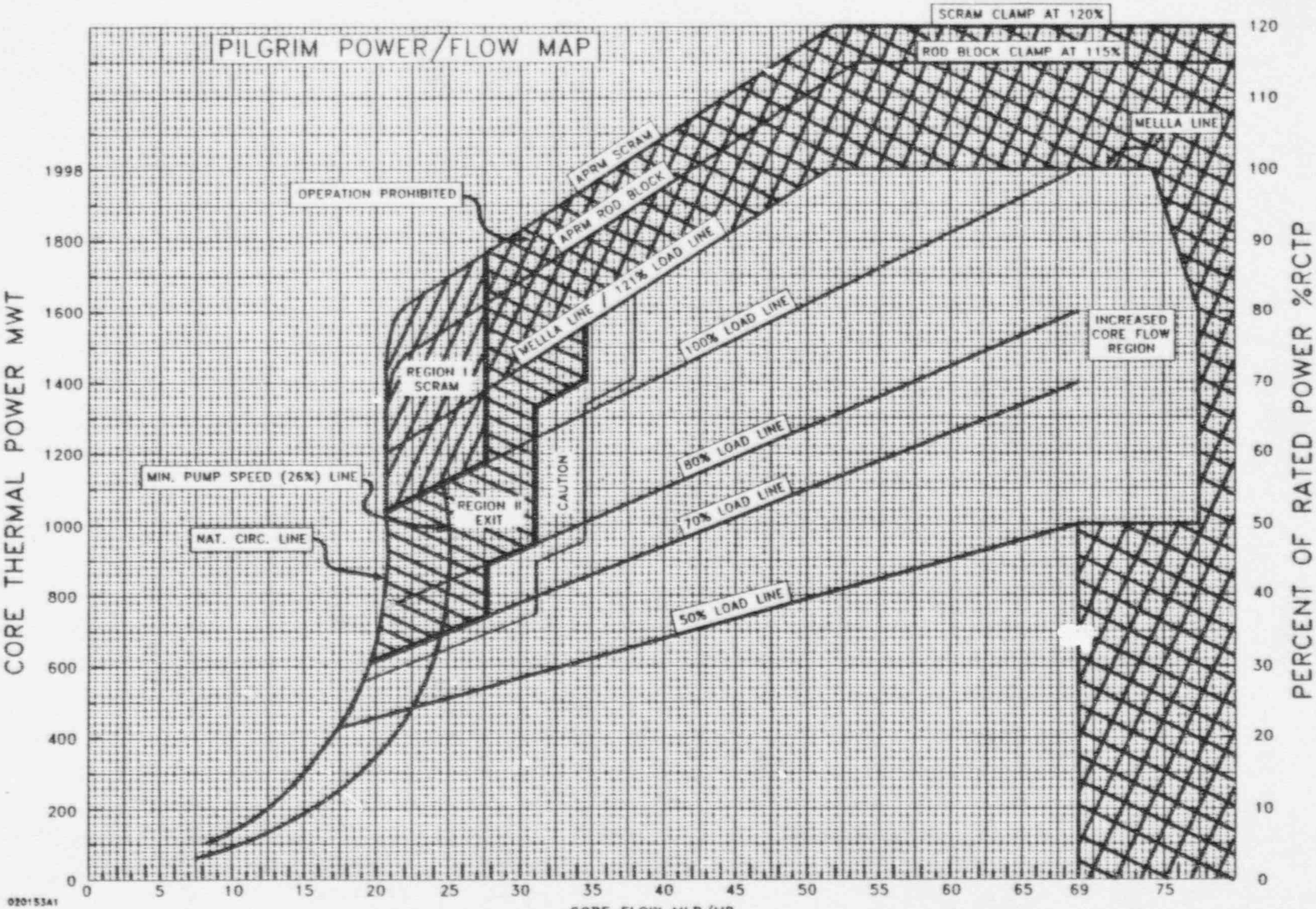
FIGURE 2

1. Enter the Torus Wide Range water level from LI-1001-604A/B (C170/C171) and calculate the Torus Bottom Pressure Correction Factor.

WIDE RANGE TORUS LEVEL (in.) LI-1001-604A/B ______________	X	0.036 psi/in.	=	TORUS BOTTOM PRESSURE CORRECTION FACTOR ______________ psi

2. Enter the Torus Bottom Pressure Correction Factor and Torus Bottom Pressure from PI-1001-69A/B (C903) and calculate the Torus Air Space Pressure.

TORUS BOTTOM PRESS PI-1001-69A/B __________ psig	- (minus)	TORUS BOTTOM PRESSURE CORRECTION FACTOR __________ psig	=	TORUS AIR SPACE PRESSURE __________ psig


PILGRIM POWER/FLOW MAP
SCRAM CLAMP AT 120%
ROD BLOCK CLAMP AT 115%
MELLLA LINE
APRM SCRAM
APRM ROD BLOCK
OPERATION PROHIBITED
MELLLA LINE / 121% LOAD LINE
100% LOAD LINE
80% LOAD LINE
70% LOAD LINE
50% LOAD LINE
INCREASED CORE FLOW REGION
REGION I SCRAM
REGION II EXIT
CAUTION
MIN. PUMP SPEED (26%) LINE
NAT. CIRC. LINE
CORE THERMAL POWER MWT
0
200
400
600
800
1000
1200
1400
1600
1800
1998
PERCENT OF RATED POWER %RCTP
0
10
20
30
40
50
60
70
80
90
100
110
120
CORE FLOW MLB/HR
0
5
10
15
20
25
30
35
40
45
50
55
60
65
69
75
020153A1

ATTACHMENT 2

FINAL SRO EXAMINATION AND ANSWER KEY

SRO FINAL

PILGRIM NUCLEAR POWER STATION
SRO NRC INITIAL LICENSING EXAMINATION

FACILITY: Pilgrim 1

REACTOR TYPE: BWR-GE3

DATE ADMINISTERED: ______________

CANDIDATE: ______________

INSTRUCTIONS TO CANDIDATE:

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

NUMBER QUESTIONS	TOTAL POINTS	CANDIDATE'S POINTS	CANDIDATE'S OVERALL GRADE (5)

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

____
Candidate's Signature

SRO REFERENCES IN ADDITION TO those PROVIDED ON THE EXAMINATION

- TECHNICAL Specifications
  - TABLE of Contents
  - Section 3/4 LCO & Surveillance
    without - 3.1 or 3.2.G
    - Bases or definitions

- Emergency Action Level Classification CHART

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

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

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

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

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

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

6. Fill in the date on the cover sheet of the examination (if necessary).

7. You may write your answers on the examination question page or on a separate sheet of paper. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

8. If you write your answers on the examination question page and you need more space to answer a specific question, use a separate sheet of the paper provided and insert it directly after the specific question. DO NOT WRITE ON THE BACK SIDE OF THE EXAMINATION QUESTION PAGE.

9. Print your name in the upper right-hand corner of the first page of answer sheets whether you use the examination question pages or separate sheets of paper. Initial each of the following answer pages.

10. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.

11. If you are using separate sheets, number each answer and skip at least three (3) lines between answers to allow space for grading.

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

13. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.

14. The point value for each question is indicated in parentheses after the question. The amount of blank space on an examination question page is NOT an indication of the depth of answer required.

NRC Rules and Guidelines for License Examinations (cont.)

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

16. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK. NOTE: Partial credit will NOT be given on multiple choice questions.

17. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.

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

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

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

21. There is a time limit of 4 hours for completion of the examination.

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

SROExam/104

NAME: ____________________

DATE: ____________________

SRO Licensing Exam of November 22, 1995

ANSWER KEY

1.0 _____
2.0 _____
3.0 _____
4.0 _____
5.0 _____
6.0 _____
7.0 _____
8.0 _____
9.0 _____
10.0 _____
11.0 _____
12.0 _____
13.0 _____
14.0 _____
15.0 _____
16.0 _____
17.0 _____
18.0 _____
19.0 _____
20.0 _____
21.0 _____
22.0 _____
23.0 _____
24.0 _____
25.0 _____
26.0 _____
27.0 _____
28.0 _____
29.0 _____
30.0 _____
31.0 _____
32.0 _____
33.0 _____
34.0 _____
35.0 _____
36.0 _____
37.0 _____
38.0 _____
39.0 _____
40.0 _____
41.0 _____
42.0 _____
43.0 _____
44.0 _____
45.0 _____
46.0 _____
47.0 _____
48.0 _____
49.0 _____
50.0 _____
51.0 _____
52.0 _____
53.0 _____
54.0 _____
55.0 _____
56.0 _____
57.0 _____
58.0 _____
59.0 _____
60.0 _____
61.0 _____
62.0 _____
63.0 _____
64.0 _____
65.0 _____
66.0 _____
67.0 _____
68.0 _____
69.0 _____
70.0 _____
71.0 _____
72.0 _____
73.0 _____
74.0 _____
75.0 _____
76.0 _____
77.0 _____
78.0 _____
79.0 _____
80.0 _____
81.0 _____
82.0 _____
83.0 _____
84.0 _____
85.0 _____
86.0 _____
87.0 _____
88.0 _____
89.0 _____
90.0 _____
91.0 _____
92.0 _____
93.0 _____
94.0 _____
95.0 _____
96.0 _____
97.0 _____
98.0 _____
99.0 _____
100.0 _____

1.0

Which one of the following is correct concerning the administrative requirements on the use of the RHR fuel pool cooling cross-tie?

A. During periods of reactor operation, the RHR fuel pool cooling cross-tie shall not be utilized due to the non-seismic design of the associated piping.

B. During periods of reactor operation, the RHR fuel pool cooling cross-tie shall not be utilized due to the flow rate requirements for RHR being in LPCI lineup.

C. During periods of reactor operation, the RHR fuel pool cooling cross-tie can be utilized for 24 hours if the fuel pool cooling system is inoperable.

D. During periods of reactor operation, the RHR fuel pool cooling cross-tie can be utilized for 72 hours if the fuel pool cooling system is inoperable.

2.0

A tagout that requires independent verification is being performed , and the tagout includes an inaccessible valve in the containment. The valve has already been closed and de-energized by an existing tagout. The method used for independent verification is:

A. The persons that performed the existing tagout must be the verifiers.

B. The tagout cannot be done until the existing tagout is cleared.

C. The verifiers must independently energize the breaker and verify the valve position.

D. The verifiers must independently use the existing tagout to determine the valve's position.

3.0

A 25 year old NPRO (Non-Licensed) has a current YTD TEDE of 1700 mr. Due to an unusual situation (not an emergency), the individual has volunteered for a planned special exposure. The individual has not had any prior planned special exposure, and his current cumulative lifetime exposure is 4000 mr. Which of the following is the maximum TEDE exposure allowed per 10CFR20 for the planned special exposure?

A. 3300 mr

B. 5000 mr

C. 20000 mr

D. 25000 mr

4.0

During a Site Area Emergency, the NWE has been relieved of the Emergency Director duties by the on-call ED. Which of the following is permitted regarding authorization of emergency exposures.

A. The Emergency Director may delegate authority to the NWE and Emergency Plant Manager.

B. Only the Emergency Director may authorize emergency exposures.

C. The Emergency Director may delegate authority to the NWE, but not the Emergency Plant Manager.

D. The Emergency Director may delegate authority to the Emergency Plant Manager, but not the NWE.

5.0

While making rounds, a plant operator, using his key card, is unable to enter a vital area for which he has access.

Select the ONE statement below that correctly describes the use of the medico vital area key.

A. Use a medico vita area key to enter and notify security when leaving the area.

B. Notify Security prior to entering and then use the medico vital area key to enter.

C. Use a medico vital area key to obtain entry; notification of Security is not required.

D. Do not use a medico vital area key in this situation.

6.0

During the day shift, WHICH ONE of the following describes your responsibilities once you have found a high pressure cylinder that DOES NOT have a High Pressure Cylinder Control Tag (HPCCT)?

A. Notify the Chemical Control Coordinator immediately to repair the deficiency.

B. Notify the Safety Engineer and/or NWE to correct the deficiency.

C. Notify the Administrative Assistant in the Control Room Annex to issue a new HPCCT.

D. Notify Tool Management personnel to reissue a copy of the original HPCCT, or issue a new HPCCT.

7.0

Regarding a spill of sodium pentaborate:

A. Clean up using wet mops and wipes, discard in containers in the chemical process area.

B. Clean up using dry mops and wipes and discard under the guidance of the Chemistry Supervisor.

C. Clean up using dry mops and wipes and only dispose of in radwaste chem. waste tanks.

D. Wash down floors using water and let drain through floor drains.

8.0

Regarding the attendant's duties for a confined space:

A. The attendant may monitor more than one adjacent permit-required confined space and may perform rounds on nearby areas.

B. The attendant may monitor more than one adjacent permit-required confined space and may not perform rounds on nearby areas.

C. The attendant may not monitor more than one adjacent permit-required confined space and may perform rounds on nearby areas.

D. The attendant may not monitor more than one adjacent permit-required confined space and may not perform rounds on nearby areas.

9.0

Which one of the following is the first action taken by the Fire Brigade Leader when notified of a fire?

A. Don the required protective clothing, then go to the scene of the fire to evaluate the situation and report back all pertinent information and instructions to the Control Room.

B. Go directly to the scene of the fire to evaluate the situation and report back all pertinent information and instructions to the Control Room.

C. Assemble the fire Brigade in the control room, brief them on what information is available about the fire, and lead them to the location of the fire.

D. Notify the Plymouth Fire Department to standby, then go to the scene of the fire to evaluate the situation and report back all pertinent information and instructions to the Control Room.

10.0

The "A" CRD pump motor has a Green tag on it.

SELECT the statement that describes the non-emergency operating concerns of the CRD pump.

A. The pump cannot be operated except at the request of the permit holder or designee.

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

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

D. The pump cannot be operated unless the tag is cleared/removed.

11.0

WHICH ONE of the following constitutes the minimum number of pumps required to establish an operable containment cooling sub-system loop as defined by Technical Specifications?

	LPCI	RBCCW	SSW
A.	1	1	3
B.	1	2	2
C.	2	1	1
D.	2	2	2

12.0

Which one of the following is the required reactor pressure and core flow prior to exceeding 25% thermal power?

A. 785 psig and 20%.

B. 785 psig and 10%.

C. 600 psig and 20%.

D. 600 psig and 10%.

13.0

WHICH ONE of the following individuals is allowed to make changes to the Reactor Recirculation flow rate while the reactor is at power?

A. A system engineer, holding an inactive SRO license, to check valve response, provided consent from the NPRO at the controls is obtained.

B. A licensed RO from another station in the SRO training program and under the direction of the lead training instructor.

C. An unlicensed individual in the SRO Training Program, after having the consent of the Shift Control Room Engineer.

D. An individual is currently enrolled in a licensed operator training program and is under the direct supervision of the NPRO.

14.0

Which one of the following is the two logs that must be maintained for OPERATIONS SHIFT RECORDS?

A. NWE log and NOS log.

B. NWE log and NPRO log.

C. NOS log and NPRO log.

D. NOS log and Radwaste Operators log.

15.0

A complex, planned evolution is to be performed. Select the statement which BEST describes the requirements for performance:

A. The NOS will conduct a pre-evolution briefing and will assign the planned evolution duties to the Licensed Operator who has the control room duties.

B. The NOS will conduct a pre-evolution briefing and will assign the planned evolution duties to a second Licensed Operator that does not have the control room duties.

C. The NOS will not conduct a pre-evolution briefing and will assign the planned evolution duties to the Licensed Operator who has the control room duties.

D. The NOS will not conduct a pre-evolution briefing and will assign the planned evolution duties to a second Licensed Operator that does not have the control room duties.

16.0

Ten minutes following a reactor scram these parameters are reported:

Reactor water level +5 inches lowering slowly.
ECCS equipment HPCI OOS, RCIC injecting at 400 gpm
Drywell pressure 5 pounds steady
Power is IRM range six and lowering

Using the EAL chart provided, which of the following is the correct NWE decision regarding classifications:

A. No classifications at this time.

B. Unusual Event.

C. Alert.

D. Site Area Emergency.

17.0

Given the following conditions after a LOCA:

- Drywell and torus pressure increases to 30 psig and then rapidly decreases to 10 psig.
- RPV level rapidly decreases to -40 inches and then slowly increases.
- RPV pressure decreases to 400 psig.
- Torus level remains in normal limits.

Which one of the following is correct in regards to Emergency Classification(s)?

A. Make classification and notifications for a Site Area Emergency.

B. Make classification and notifications for an Alert.

C. Make classification and notifications for a Site Area Emergency and immediately downgrade it to an Alert.

D. Make classifications and notifications for an Alert and immediately downgrade it to an Unusual Event.

Deleted

18.0

Select the expected automatic response to the trip of one feedwater pump while operating at 100% power.

A. Reactor recirculation pumps immediately run back to 44% speed.

B. Reactor recirculation pumps run back to minimum speed when the RPV low level alarm is received.

C. Reactor recirculation pumps run back to 44% speed when the RPV low level alarm is received.

D. Reactor recirculation pumps immediately run back to minimum speed.

19.0

The plant is operating at 100% power with the individual feed regulator valves in MANUAL when the feedwater flow summer fails downscale. What is the effect on plant conditions with no operator action?

A. Recirculation pump speeds remain the same and the reactor scrams on low RPV level.

B. The recirculation pumps run back to 20% speed, and the reactor scrams when the turbine trips on high level.

C. The recirculation pumps run back to 26% speed, and the reactor scrams when the MSIVs shut.

D. The recirculation pumps speed remain the same and the reactor scrams when the turbine trips on high level.

Deleted

20.0

With the plant initially at 100% of rated conditions, a leak in recirc loop "A" generates a valid LOCA signal of 2.2 psig in the drywell. Concerning the response of the RHR system, determine which of the following is TRUE:

A. The white lights below the LPCI INJECTION VALVES (MO-1001-29A & 29B) illuminate (SDC isolation lights).

B. All RHR containment valves except the TORUS COOLING VALVES (MO-1001-36A & 36B) auto close.

C. The HX BYPASS VALVES (MO-1001-16A & 16B) open for one minute and are interlocked open for 5 minutes, along with the LPCI INJECTION THROTTLE VALVE (MO-1001-28B).

D. The LPCI INJECTION THROTTLE VALVE (MO-1001-28A) and the LPCI INJECTION VALVE (MO-1001-29A) are sealed closed for 10 minutes.

21.0

WHICH ONE of the following describes the normal operation of the high pressure coolant injection (HPCI) minimum flow valve (MO-2301-14) with its control switch in the AUTO position?

A. Normally closed, automatically opens on HPCI initiation and automatically closes when the HPCI injection valve indicates full open.

B. Normally open, automatically closes after HPCI initiation and system flow is greater than 800 gpm.

C. Normally open and automatically closes when the HPCI injection valve indicates full open.

D. Normally closed, automatically opens on HPCI initiation and closes after system flow is greater than 800 gpm.

22.0

The condensate transfer system is out of service. The "A" and "B" core spray suction valves are closed to isolate a suppression pool leak. Select which ECCS pumps will be impacted by the above conditions.

A. The "A" and "B" core spray pumps are the only ECCS electric pumps affected

B. The core spray system is the only ECCS system which lost keep fill pressure

C. Keep fill is lost to the suction piping of all ECCS electric pumps

D. Keep fill is lost to the discharge piping of all ECCS electric pumps

23.0

Assume RPV level is +48 inches and RPV pressure is 1050 psig. BOTH will remain constant. 60 minutes following a full power ATWS, 1100 gallons of sodium pentaborate has been injected into the RPV and completely mixed. Which of the following describes the reactor when the sodium pentaborate was injected and twelve hours later due to xenon decay.

A. The reactor should be shutdown, and be more subcritical after 12 hours due to xenon decay.

B. The reactor should be shutdown, but before 12 hours have elapsed, returned to critical status due to xenon decay.

C. The reactor should not be shutdown, but will be shutdown before 12 hours have elapsed due to xenon decay.

D. The reactor should not be shutdown and will be at a higher power after 12 hours due to xenon decay.

24.0

An electrical transient has caused the "A" RPS MG set to trip. Which of the following is the cause?

A. Lockout of bus A-3.

B. Slow transfer of bus B-6.

C. "A" diesel generator load shed.

D. Fault on bus B-10.

25.0

The reactor is operating at 100% power. The status of "B" APRM is as follows:

Level A	3 of 3 LPRM inputs operable
Level B	2 of 3 LPRM inputs operable
Level C	3 of 4 LPRM inputs operable
Level D	4 of 4 LPRM inputs operable

At this time, another level B input fails downscale. The effect on "B" APRM is:

A. "B" APRM generates an INOP trip and is declared Administratively INOP as well.

B. "B" APRM does not generate an INOP trip, but is declared Administratively INOP.

C. "B" APRM generates an INOP trip, but is not Administratively INOP.

D. "B" APRM does NOT generate an INOP trip and is NOT declared Administratively INOP.

26.0

Describe the effect of instrument line rupture and elevated drywell temperatures on RPV narrow range level readings.

A. Reference leg rupture and DW high temperature both result in HIGHER instrument readings.

B. Reference leg rupture and DW high temperature both result in LOWER instrument readings.

C. Variable leg rupture and DW high temperatures both result in HIGHER instrument readings.

D. Variable leg rupture and DW high temperatures both result in LOWER instrument readings.

27.0

During a reactor startup, the operator closes the reactor head vents and observes the FWLC instruments indicate 25 inches and are rising. As the operator maintains level (on FWLC instruments), he notes that the narrow range instruments are lowering. The most probable cause of this event is:

A. The narrow range instruments have not been properly calibrated.

B. This is expected since the FWLC instruments are calibrated at different conditions than the narrow range instruments.

C. Non-condensable gases are present in the FWLC reference leg and have collapsed as reactor pressure increased.

D. Narrow range level instruments have been inadvertently valved out of service.

28.0

PNPS is at 100% power when a loss of feedwater event occurs causing reactor water level to decrease to negative 65 inches. HPCI fails to initiate, RCIC does automatically initiate and reactor water level is now increasing. SELECT the statement which describes the automatic RCIC system response if no operator action is taken.

A. At +45 inches a RCIC isolation signal is generated. The isolation will automatically clear at negative 46 inches and decreasing and RCIC injection will commence.

B. At +45 inches a RCIC turbine trip signal is generated. The turbine trip will automatically clear at +45 inches and decreasing and RCIC injection will not commence until -46 and decreasing.

C. At +45 inches a RCIC turbine trip signal is generated. The turbine trip will automatically clear at negative 46 inches and decreasing and RCIC injection will commence.

D. At +45 inches the RCIC steam supply valve shuts. The valve will automatically reopen at negative 46 inches and decreasing and RCIC injection will commence.

29.0

The current plant conditions include annunciators 903L-A1, ADS Power Failure and C3RC-A7, A 125 VDC undervoltage. The effect that this has on the ADS system is:

A. ADS will NOT automatically initiate due to loss of logic power, but all four SRVs can still be opened manually.

B. ADS will automatically initiate if required but only the B&D SRVs will open.

C. ADS will NOT automatically initiate and only the B&D SRVs can be opened manually.

D. ADS will automatically initiate if required and all four SRVs will still open.

30.0

The reactor has scrammed, the lowest RPV level reported was +8" and is now rising slowly. Reactor building ventilation supply & exhaust fans are operating. RCIC is in standby readiness. After verifying automatic actuations, you should:

A. Depress RCIC initiation pushbutton.

B. Start Standby Gas Treatment System "A".

C. Place RBIS "TEST LOGIC/TRIP" switches into the ISOLATE position.

D. No operator actions are required, all systems are functioning normally.

31.0

An operator reports the following primary containment indications during a plant startup:

DW Pressure:	0.35 psig
Torus Airspace Pressure:	0.30 psig

No DW/Torus Vacuum Breaker Indication for X201 B on Panel C-7
DW/Torus Vacuum Breaker Open (904LC-E1) Alarm is in Alarm

Based on this report:

A. The vacuum breaker is operating correctly and will shut when DW pressure exceeds torus pressure.

B. The vacuum breaker is operating correctly and will shut when torus pressure exceeds DW pressure.

C. The vacuum breaker has lost control power and is full open.

D. The vacuum breaker has failed partially open.

32.0

With the unit at power, surveillance procedure 8.5.4.4, HPCI Valve Quarterly Operability, is in progress. While stroking close MO-2301-5, HPCI outboard isolation valve, the overload annunciator for that valve is received followed by a trip of its supply breaker. Further investigation indicates that the valve is mechanically bound in the partially closed position. Which one of of the following will satisfy the MINIMUM actions required to comply with primary containment integrity Tech Specs and station procedures?

A. Red tagging the MO-2301-5 breaker in the open position and the associated valve control switch in the control room.

B. Red tagging the MO-2301-5 control switch in the control room.

C. Closing MO-2301-4, HPCI Inboard Isolation Valve, opening its supply breaker and red tagging both the breaker and the control switch.

D. Closing MO-2301-4, HPCI Inboard Isolation Valve, and red tagging the control switch.

33.0

There are interlocks that prevent initiation of containment spray. Which one of the following is correct concerning these interlocks?

A. Drywell pressure must be greater than 2.2 psig and RPV level must be greater than 2/3 core height. A keylock switch can be used to override the 2/3 core height requirement.

B. Drywell pressure must be greater than 2.2 psig and RPV level must be greater than 2/3 core height. A keylock switch can be used to override the 2.2 psig drywell pressure requirement.

C. Drywell pressure must be greater than 1.8 psig and RPV level must be greater than 2/3 core height. A keylock switch can be used to override the 2/3 core height requirement.

D. Drywell pressure must be greater than 1.8 psig and RPV level must be greater than 2/3 core height. A keylock switch can be used to override the 1.8 psig drywell pressure requirement.

34.0

The combined flow capacity of the Safety Valves, Safety//Relief Valves and Main Turbin
Bypass Valves is:

A. 105%.

B. 86%.

C. 81%.

D. 73%.

35.0

A reactor startup is in progress. The following conditions exist:

Mode Switch in RUN
Reactor power 8% (Average APRM)
Reactor pressure 930 psig
Reactor water level 30 inches

A malfunction in the Mechanical Hydraulic Control System causes ALL turbine bypass valves to fully open.

SELECT the AUTOMATIC plant response.

A. MSIV closure on High Main Steam Line Flow AND Reactor Scram on low RPV level.

B. MSIV closure on High Main Steam Line Flow AND Reactor Scram on High Reactor Pressure on High APRM Flux.

C. MSIV closure on Low Main Steam Line Pressure AND Reactor Scram on MSIV closure.

D. MSIV closure on Low Main Steam Line Pressure AND Reactor Scram on High Reactor Pressure or High APRM Flux.

36.0

While at 90% power, an SRV opens. Which statement is correct concerning steam flow and RPV level.

A. Steam flow decreases, RPV level decreases.

B. Steam flow decreases, RPV level increases.

C. Steam flow increases, RPV level decreases.

D. Steam flow increases, RPV level increases.

37.0

Train "A" of the Standby Gas Treatment System has been taken out of service due to an inoperable fan. According to the system procedure, the control switch for the "B" Standby Gas Treatment System fan is taken from "STANDBY" to "MAINTENANCE". SELECT the statement that describes the reason for this action.

A. The "A" train inlet and outlet damper will not open upon receipt of a system initiation signal.

B. The cross-connect dampers between the filter trains are shut to isolate the "A" train following system initiation.

C. The "B" train is prevented from shutting down after a 65 second time delay following system initiation.

D. The "B" train is prevented from shutting down on low-flow for 10-15 seconds following system initiation.

43.0

Reactor startup is in progress. Control rod 12-24 is being withdrawn to position 24 when a rod worth minimizer (RWM) withdraw block alarm is received; the rod settles to position 26. WHICH ONE of the following control rod manipulations is possible?

A. Insert control rod 12-24.

B. Select a control rod in a different group.

C. Select a different rod in this latched group and insert it one notch.

D. Select a different rod in this latched group and withdraw it one notch.

44.0

The plant is operating at 70% with only "A" reactor recirculation pump running. Which ONE of the following conditions represents the plant status?

A. "B" jet pump flow is reverse, indicated core flow is the same as actual core flow.

B. "B" jet pump flow is reverse, indicated core flow is greater than actual core flow.

C. "B" jet pump flow is forward, indicated core flow is the same as actual core flow.

D. "B" jet pump flow is forward, indicated core flow is greater than actual core flow.

45.0

WHICH ONE of the following contains ONLY signals that will shut Reactor Water Cleanup Valve MO-2, RWCU Supply Inboard Isolation?

A. Non-Regenerative Heat Exchangers inlet temperature at 150 degrees F, Activation of the Standby Liquid Control System, RWCU Area Ambient Temperature at 200 degrees F.

B. Activation of the Standby Liquid Control System, RWCU Area Ambient Temperature at 200 degrees F, Non-Regenerative Heat Exchanger outlet temperature of 150 degrees F.

C. RWCU Area Ambient Temperature at 200 degrees F, RWCU inlet flow 200% of rated, Non-Regenerative Heat Exchanger outlet temperature of 150 degrees F.

D. Non-Regenerative Heat Exchanger outlet temperature of 150 degrees F, Activation of the Standby Liquid Control System, RWCU inlet flow 200% of rated.

46.0

RHR Pump "A" is operating in the Shutdown Cooling Mode. RPV level momentarily drops to 0 inches before recovering.

SELECT the RHR System response.

A. MO-1001-47 and MO-1001-50 valves remain open and MO-1001-29 valve closes.

B. MO-1001-47 and MO-1001-50 valves remain open and MO-1001-29 valve remains open.

C. MO-1001-47 and MO-1001-50 valves close and MO-1001-29 valve remains open.

D. MO-1001-47 and MO-1001-50 valves close and MO-1001-29 valve closes.

47.0

While withdrawing a control rod at 90% power, the "B" APRM fails downscale. Which one of the following describes the effect on the "B" Rod Block Monitor with no operator action:

A. The upscale trip setpoint will be increased and the "D" APRM will automatically engage as the reference APRM.

B. The upscale trip setpoint will decrease and the "B" APRM will remain engaged as the reference APRM.

C. The RBM will be automatically bypassed and the "D" APRM will automatically engage as the reference APRM.

D. The RBM will be automatically bypassed and the "B" APRM will remain engaged as the reference APRM.

48.0

During a reactor startup, with all IRM channels indicating 80 on range 4, the reactor operator inadvertantly downranges IRM B to range 3.

Select the expected automatic actions, if any.

A. IRM "downscale" annunciator and rodblock.

B. No automatic actions occur.

C. IRM channel "B" inop trip and rod block.

D. IRM B "Hi" annunciator, rod block and RPS channel "B" trip.

49.0

The direction has been given to initiate torus sprays. WHICH ONE of the following describes a line-up which assures that design limits are met for 1) adequate torus sprays and 2) residual heat removal (RHR) equipment operation?

A. RHR pump "A" is running, the heat exchanger bypass valve (MO-1001-16A) is closed and the heat exchanger flow is 4850 gpm.

B. RHR pump "A" is running, the heat exchanger bypass valve (MO-1001-16A) is open and the heat exchanger flow is 3350 gpm.

C. RHR pumps "A" and "C" are running; the heat exchanger bypass valve (MO-1001-16A) is closed and the heat exchanger flow is 6150 gpm.

D. RHR pumps "A" and "C" are running; the heat exchanger bypass valve (MO-1001-16A) is open and the heat exchanger flow is 5050 gpm.

50.0

WHICH ONE of the following would explain why both recirculation MG sets tripped and the following alarms are received, "Annunciator Power Fail" and "Alarm System Power Fail"?

A. Loss of 125 VDC bus D-4.

B. Loss of 125 VDC bus D-5.

C. Loss of 125 VDC panel D-6.

D. Loss of 250 VDC safeguard MCC B-14.

51.0

PNPS is starting up at 3% power when a main steam line radiation increases to 4 times normal background level.

Select the automatic trip signals that should have occurred.

A. Group 1 Isolation and mechanical vacuum pump trip.

B. Group 1 isolation and no mechanical vacuum pump trip.

C. No Group 1 isolation and a mechanical vacuum pump trip.

D. No Group 1 isolation and no mechanical vacuum pump trip.

52.0

The unit is operating at 100% reactor power and experiences a problem with the main generator. The operating crew reduces load to 14,800 amps in 90 seconds.

"A" Stator Water Cooling Pump	Running
"B" Stator Water Cooling Pump	Running
Stator Cooling Outlet Temperature	82 Degrees Celius
Stator Cooling Water Inlet Pressure	51 psig

With no additional operator actions:

A. The generator will trip in 30 seconds due to generator amps.

B. The generator will trip in 30 seconds due to stator water inlet pressure.

C. The generator will trip in 4 minutes due to stator water outlet temperature.

D. The generator will continue to run.

53.(

The feedwater level control system is operating in single element control with one feedwater regulating valve in master auto control. (Reactor power is approximately 30%). The second feedwater regulating valve is being placed in service. The operator slowly opens the second feedwater valve with its manual knob until its demand is equal to the first valve. During the time the second feedwater regulating valve is being opened, the affect on the first valve is:

A. The demand signal on the first valve will remain the same. As the second valve is opened, reactor water level will increase above the level setpoint. The operator will compensate for this by throttling the first valve closed.

B. The demand signal on the first valve will decrease. As the second valve is opened, reactor water level will increase above the level setpoint. The FWLC system will automatically compensate for this by throttling the first valve closed.

C. Initially, the demand signal for the first valve will increase because the FWLC system will sense a feed flow/steam flow mismatch. Once the mismatch is corrected, the demand signal will stabilize.

D. The first valve demand signal will decrease as the second valve is opened due to a built-in bias in the controllers.

54.0

With the reactor at 100% power, WHICH ONE of the following conditions could cause a control rod to drift OUT?

A. DCV 120 fails open (settle/direction control valve).

B. CRD drive water pressure control valve closes (302-8)

C. Collet fingers stuck out.

D. Buffer piston clogged.

55.0

WHICH ONE of the following describes the power supply configuration of the Inboard and Outboard MSIV solenoids?

A. Both Inboard MSIV solenoids are powered from RPS 120 VAC.

B. Both Outboard MSIV solenoids are powered from 125 volt DC bus A or B.

C. The Inboard MSIVs have one solenoid powered from RPS 120 VAC AND one solenoids powered from 125 volt DC bus A or B.

D. The Outboard MSIVs have one solenoid powered from 120 safeguards VAC bus A or B AND one solenoid powered from 125 Volt DC bus A or B.

56.0

During a loss of all SSW pumps, the last condensate pump is kept running:

A. until the vapor valves are shut.

B. until the turbine has tripped.

C. until the MSIVs are shut.

D. to maintain CRD pump suction pressure until the rods have inserted.

57.0

The reactor is at 100% power when the following conditions are noted. Indications from last hour are given. Conditions are now stable.

	T = 0	**T = 60**
Recirc Pump A Speed	69.9	69.9
Recirc Pump B Speed	70.1	70.1
Total Core Flow	55 Mlb	44 Mlb
Power	100%	85%
Loop Flow A	35,000 gpm	37,000 gpm
Loop Flow B	35,000 gpm	48,000 gpm

What action, if any, is necessary as a result of these indications?

A. Be in cold shutdown within 24 hours.

B. Initiate a reactor scram.

C. Operation is permissible only during the succeeding seven days.

D. No action is required.

58.0

The following conditions exist:

EDG "A" on bus A-5, sharing with the UAT
EDG "B" on bus A-6, sharing with the SUT
All fast transfer switches are "ON"

The reactor scrams on a +2.2 psi high drywell pressure signal. What is the final status of the electrical distribution system?

A. A-5 and A-6 are on the SUT.

B. A-5 is being powered by the SUT.
A-6 is being powered by the EDG.

C. A-5 and A-6 are on the EDGs in.

D. A-5 is being powered by EDG "A".
A-6 is being powered by the SUT.

59.0

A loss of offsite power occurs. Bus A-5 is being powered by the Station Blackout Diesel. Bus A-6 is being powered by "B" EDG. Drywell pressure is 2.9 psi. Regarding the high pressure instrument air system:

A. No compressors are running due to lack of power to A-1 through A-4.

B. K-104C is running but cannot maintain air pressure >85 psig.

C. K-104C is running with air pressure being maintained >85 psig.

D. No compressors are running due to loss of power and load shedding.

60.0

Which of the following scram signals are always available to generate a scram signal, regardless of plant conditions?

A. Turbine Stop Valve Fast Closure.

B. IRM High High.

C. Reactor Hi Pressure.

D. Main Steam Line Valve Closure.

61.0

A loss of Y-2 has occurred. Which statement describes the expected operator actions to this malfunction?

A. Manually scram the reactor and immediately trip the RFP due to loss of cooling water.

B. Monitor narrow range level instruments on 905 and scram the reactor if a turbine trip is imminent.

C. Manually scram the reactor and monitor power indication using the IRMs and SRMS on 905.

D. Monitor condensate and feedwater systems due to reduced cooling water flow and initiate a plant shutdown.

62.0

WHICH ONE of the following is the basis for the action in EOP-01, "RPV Control", which directs that reactor pressure vessel pressure be controlled below 1085 psig with safety relief valves (SRVs) IF any SRVs are cycling?

A. Controls RPV pressure to within the capability of high pressure injection systems to inject.

B. Controls RPV pressure below the lowest SRV lift pressure.

C. Prevents RPV damage due to cyclic loading.

D. Minimizes damage due to hydrodynamic loading in the torus.

63.0

While operating at 100% power, a feedwater control system malfunction causes reactor water level to decrease to +18 inches (and lowering). The reactor continues to operate at 100% power.

WHICH ONE of the following is a required immediate operator action?

A. Manually initiate a reactor scram.

B. Reduce reactor power as necessary to maintain level.

C. Depress FRV lockup reset and place FRV controllers in manual.

D. Shift the feedwater control system from 3 element to 1 element control and allow it to restore level automatically.

64.0

Which of the following is the cause if the only indications of a possible FWLC problem are the red light above a 905 FRV controller is ON, and the clear light above that 905 FRV controller is OFF?

A. Loss of air to a feedwater flow control valve.

B. Loss of lockup circuit power to a feedwater flow control.

C. Loss of feedwater valve control signal.

D. Loss of flow mismatch signal to a feedwater flow control valve.

65.0

WHICH ONE of the following is the required immediate operator action on a noted drywell pressure rise following DW cooler trips.

A. Start all available drywell fans.

B. Terminate drywell inerting.

C. Isolate instrument air to the drywell.

D. Vent the DW through SGTS.

66.0

The following conditions exist after a loss of off-site power:

Reactor power	0%
Reactor pressure	940 psig, steady
Reactor level	25 inches, steady
Torus temperature	87°F, rising
Drywell pressure	2.7 psig, steady

The operator is ordered to maximize torus cooling and drywell cooling. Which statement is correct regarding the RHR system when all actions have been performed?

A. RBCCW temperature setpoint is at 70°F, RHR pumps A and C are running, 1001-16A and 1001-16B (RHR heat exchanger bypass valves) are partially shut, 1001-19 is open.

B. RHR pump B and C are running, 1001-16A and 16B (RHR heat exchanger bypass valves) are shut, 1001-19 is open.

C. RHR pump A and D are running, 1001-16A and 16B (RHR heat exchanger bypass valves) are fully open, 1001-19 is open.

D. RHR pumps B and D are running, 1001-16A and 16B (RHR heat exchanger bypass valves) are shut, 1001-19 is shut.

67.0

Given an ATWS, WHICH ONE of the following methods for inserting control rods requires the SDIVs to be drained?

A. Individual scram test switches.

B. Insert control rods by increasing cooling water differential pressure.

C. Maximizing drive water pressure for control rod insertion.

D. Venting the overpiston area of the control rod drives.

68.0

There is a reactor scram and the following events occur:

Level decreases to +3 inches and then increases to +30 inches
Two control rods stay at position 48 and the others all insert to 00
All other parameters and conditions are normal

Which one of the following is the correct course of action?

A. Enter both EOP-01 and EOP-02 and perform them concurrently. EOP-02 directs you to the alternate rod insertion procedure, 5.3.23, to insert the rods.

B. Enter EOP-02 directly, which directs you to the scram procedure, 2.1.6, which directs you to the alternate rod insertion procedure, 5.3.23, to insert the rods.

C. Enter EOP-01, which directs you to EOP-02, which directs you to the alternate rod insertion procedure, 5.3.23, to insert the rods.

D. Enter EOP-01, which directs you to the scram procedure, 2.1.6, which directs you to use the alternate rod insertion procedure, 5.3.23, to insert the rods.

69.0

SELECT the IMMEDIATE operator action in the event the main control room becomes uninhabitable.

A. Trip the main turbine.

B. Ensure all control rods are inserted.

C. Manually initiate RCIC.

D. Announce the event over the station paging system.

70.0

EOP-03, "Primary Containment Control", directs the operators to trip HPCI if torus level cannot be maintained >95". HPCI operation must be terminated:

A. Due to HPCI pump NPSH considerations.

B. To prevent the HPCI exhaust rupture disc from becoming a pathway outside containment.

C. To prevent the pressurization of the torus air space.

D. To maintain capability to vent the containment.

71.0

Current conditions of the reactor require that boron be injected into the vessel per EOP-02, "Failure to Scram". WHICH ONE of the following DOES NOT describes the basis for inhibiting ADS immediately before boron injection?

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

B. To prevent a rapid injection of cold, unborated water resulting in a rapid increase in power.

C. To prevent rapid cooldown during depressurization resulting in a reactivity excursion.

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

72.0

For an ATWS condition, which one of the following indicates the failure of rods to move is most probably an RPS electrical problem.

A. Blue scram lights on C905 not illuminated, and group scram logic lights on C904 not illuminated.

B. Blue scram lights on C905 are illuminated, and SCRAM VALVE PILOT HEADER LO PRESSURE alarm not illuminated.

C. Blue scram lights on C905 are illuminated, and SCRAM VALVE PILOT HEADER LO PRESSURE alarm illuminated.

D. SCRAM VALVE PILOT HEADER LO PRESSURE alarm not illuminated, and group scram logic lights on C905 are illuminated.

73.0

After a low low RPV level automatic actuation, the operator placed the controller in manual and injected at 2000 gpm. HPCI subsequently tripped on high RPV water level. RPV level is now negative 30 inches and lowering. Which of the following statements is correct:

A. HPCI will automatically inject at -46 inches at a rate of 4000 gpm.

B. HPCI will automatically inject at -46 inches at a rate of 2000 gpm.

C. HPCI will not automatically inject even if level reaches -46.

D. HPCI will trip on overspeed because the throttle valve is not fully closed.

74.0

A Main Stack Hi-Hi Radiation alarm has annunciated. Which statement below best describes the automatic actions which occur:

A. The main stack isolation valve shuts after 15 minutes if the alarm does not clear.

B. The off-gas timer initiates and will isolate the flowpath if the trip unit is not reset.

C. An RBIS signal is generated to prevent the potential release.

D. No automatic actions occur for this condition.

75.0

While operating on the 65% load line, an automatic closure of the off-gas isolation valve, due to excessive off-gas radiation levels, the operator should:

A. Place the mode switch in shutdown to scram the reactor, the MSIVs may remain open and vacuum maintained if MSL rad levels are less than 7 times normal.

B. Place the mode switch in shutdown to scram the reactor, close the MSIVs, allowing the vacuum to decay normally.

C. Place the mode switch in shutdown to scram the reactor, close the MSIVs and reduce condenser vacuum using the vacuum breakers.

D. Rapidly reduce power with both recirculation flow and control rods to maintain flow and control rods to maintain condenser vacuum. Attempt to reopen the off-gas isolation.

76.0

The plant is operating at 84% power on the MELLLA rod line with core flow at 39 Mlb/hr. when a loss of feedwater heating occurs. Which of the following actions are required:

A. Reduce power with recirc flow to 75% power.

B. Reduce power with recirc flow to 59% power.

C. Reduce core flow to 36 Mlb/hr., no further control rod motion is required.

D. Reduce core flow to 36 Mlb/hr. and insert control rods to 59% power.

77.0

Reactor building isolation and SGT actuation will result from:

A. All reactor building ventilation exhaust radiation monitors upscale.

B. All refueling floor ventilation exhaust radiation monitors upscale.

C. The standby gas treatment exhaust radiation monitor upscale.

D. The off-gas post treatment radiation monitor upscale for 5 minutes.

78.0

Which of the following IS NOT an IMMEDIATE ACTION for a high radiation alarm on the refueling floor?

A. Evacuate the refuel floor.

B. Evacuate the drywell.

C. Start CRHEAFS

D. Terminate all fuel handling operations.

79.0

EOP-03, "Primary Containment Control", directs the operator to secure torus sprays when torus pressure drops below 2.2 psig. SELECT the bases for this procedure step.

A. Prevents increasing water level in the torus and the lowering level in downcomers.

B. Prevents operation of the reactor building to torus vacuum breakers from deinerting the containment.

C. Prevents failure of containment due to external pressure.

D. Allows reset of the containment isolation logic.

80.0

Select the effect a reactor vessel pressure of 1150 psi will have on the recirc pump trip (ATWS RPT) and Alternate Rod Insertion (ARI) system.

A. Will actuate ATWS RPT, but not ARI.

B. Will actuate ARI but not ATWS RPT.

C. Will actuate ATWS RPT and ARI.

D. Will NOT actuate either ATWS RPT or ARI.

81.0

EOP-03 directs an alternate RPV depressurization if parameters cannot be maintained below the Heat Capacity Temperature Limit. The basis for this action is:

A. to ensure the torus will not fail due to high temperature caused by SRV actuation.

B. to ensure that an RPV blowdown will not result in failure of the SRV tailpipe, tailpipe supports, T-quencher, or T-quencher supports.

C. to ensure that the primary containment pressure limit will not be exceeded due to inadequate steam condensation during an RPV blowdown.

D. to ensure that the drywell below torus d/p is not exceeded after the RPV blowdown.

82.0

Following an accident, narrow range torus pressure indication is pegged high. Additionally, the drywell-to-torus differential pressure indicator has failed. In order to determine the proper course of actions to take per the EOP's, the supervisor asks you to calculate torus air space pressure. Other plant indications are as follows:

Torus Bottom Pressure
- PI-1001-69A = 21 psig
- PI-1001-69B = 21 psig

Torus Level
- LI-1001-604A = 150 in.
- LI-1001-604B = 150 in.

Which of the following most accurately reflects torus air space pressure for these conditions?

A. 13 - 13.99

B. 14 - 14.99

C. 15 - 15.99

D. 16 - 16.99

83.0

While operating at 100% power on the 118% rod line, both reactor recirculation pumps trip. Assume the reactor does not scram and ignore outside effects.

Using the power-to-flow map, select the total reactor core flow (post-trip).

A. 20.6 Mlb/hr.

B. 24.5 Mlb/hr.

C. 27.5 Mlb/hr.

D. 34.5 Mlb/hr.

84.0

The plant was operating at 100% power on the MELLLA rod pattern on the 116% rod line when the "A" recirc MG tripped.

Select the correct value for total actual core flow from the following indications:

Loop A Flow	6 Mlb/hr.	Pump A Speed 0%
Loop B Flow	42.5 Mlb/hr.	Pump B Speed 80%
Rx Power	75%	

A. 36.5 Mlb/hr. Reverse flow

B. 48.5 Mlb/hr. Reverse flow

C. 36.5 Mlb/hr. Forward flow

D. 48.5 Mlb/hr. Forward flow

85.0

While at 90% power condenser vacuum is observed to be decreasing. WHICH ONE of the following plant responses would occur if vacuum further decreases without operator action?

A. The turbine will trip at 22" Hg vacuum which will cause a reactor scram.

B. The turbine will trip at 26" Hg vacuum in a reactor scram.

C. The turbine will trip after the reactor scrams at 26" Hg vacuum.

D. The turbine will trip after the reactor scrams at 22" Hg vacuum.

86.0

WHICH ONE of the following is the reason the plant is scrammed following a LOSS OF ESSENTIAL DC BUS D-6.

A. The reactor is scrammed because the reactor will be operating in the natural circulation mode.

B. The reactor is scrammed because there will be a total loss of control room annunciators.

C. The reactor is scrammed because the inboard MSIV position indication to RPS System will lose power and cause a reactor scram.

D. The reactor is scrammed because a loss of power to turbine controls will cause a reactor scram.

87.0

Which one of the following is correct as per the Immediate Operator actions of PNPS 2.4.37, Turbine Control System Malfunctions?

A. If Rx pressure is decreasing OR oscillating, reduce core flow.

B. If Rx pressure is decreasing OR oscillating, secure the EPR switch to the OFF position.

C. If Rx pressure is increasing OR oscillating, reduce core flow.

D. If Rx pressure is increasing OR oscillating, secure the EPR switch to the OFF position.

88.0

Given the following conditions after the high drywell pressure scram:

RFP A, B, C	Tripped
RPV Level	+55 inches, lowering
Drywell Pressure	1.9 psig, lowering
Drywell Temperature	110°F, lowering
Drywell Humidity	3%, steady
HPCI Turbine Speed	0 RPM

The HPCI System status in response to these conditions is:

A. Valve 2301-3 is open, the aux oil pump is on.

B. Valve 2301-3 is closed, the aux oil pump is on.

C. Valve 2301-3 is open, the aux oil pump is off.

D. Valve 2301-3 is closed, the aux oil pump is off.

89.0

The NWE has not reviewed Daily Surveillance #7 since 1600 hours on 11/1/95.

During a review of the daily surveillance logs at noon on 11/2/95, the NWE notes the following:

See Attached OPER-9

Based on review of Daily Surveillance log #7, which of the following actions should the NWE direct:

A. Within 4 hours Engineering shall assess the potential damage and ability of safety related equipment to perform its intended function.

B. Within 24 hours Engineering shall assess the potential damage and ability of safety related equipment to perform its intended function.

C. Within 4 hours determine the operability of the instruments or initiate an orderly shutdown.

D. Within 24 hours determine the operability of the instruments or initiate an orderly shutdown.

90.0

For the following plant symptoms, select the actions required.

- "A" RBCCW surge tank low level alarm
- "A" RBCCW discharge pressure low
- RBCCW loop "A" pressure 35 psig and decreasing

A. Supply service water to RBCCW loads which service water can supply and commence a controlled reactor shutdown.

B. Isolate large heat loads and commence a controlled reactor shutdown.

C. Reduce reactor power to maintain equipment temperatures within limits.

D. Isolate the drywell cooling loops, manually run recirc. pumps to minimum speed, then place the reactor mode switch to shutdown.

91.0

Which of the following components will not be cooled if RBCCW loop A is not in service?

A. HPCI pump area cooling coil B.

B. Recirc MG set fluid coupling oil and bearing coolers.

C. VAC 205A DW air cooling coil.

D. Clean up demin non-regenerative heat exchanger.

92.0

At 90% reactor power you recognize the following annunciators are in an alarm condition. Instrument Air pressure indicates a constant 82 psig in the control room.

ALARM	PANEL	WINDOW
Instrument Air Header Pressure Low	C2 Right	A4
Service Air Header Isolated	C2 Right	A5
Standby Compressor Running	C2 Right	C5

WHICH ONE of the following ONLY contains automatic actions that can be associated with these alarms?

A. AO-4365 closes to isolate the non-essential instrument air header, backup K104 air compressor starts, AO-4353 closes to isolate instrument air from low pressure service air if it is open.

B. Backup K104 air compressor starts, AO-4353 closes to isolate instrument air from low pressure service air if it is open, AO-4350 closes to isolate the service air header.

C. AO-4353 closes to isolate instrument air from low pressure service air if it is open, AO-4350 closes to isolate the service air header, AO-4365 closes to isolate the non-essential instrument air header.

D. Backup K104 air compressor starts, AO-4350 closes to isolate the service air header, AO-4365 closes to isolate the non-essential instrument air header.

93.0

Shutdown cooling is in service with head vents open. SDC is subsequently lost. Which of the actions should the operator take:

A. Maintain level at 50" on LI-263-1001 (Rx shutdown level)

B. Maintain level at 41" on LI-263-1001

C. Maintain level at 50" on LI-263-100A/B (Rx water level narrow range)

D. Maintain level at 41" on LI-263-100A/B

94.0

While operating at full power, both CRD pumps are lost.

Which ONE of the following correctly describes conditions for which the operator is required to place the mode switch in shutdown?

A. After 20 minutes if unable to start a CRD pump.

B. When any control rod starts drifting in.

C. When more than two control rod high temperature alarms are received per nine rod square array.

D. When more than one CRD accumulator low pressure alarm occurs per nine rod square array.

95.0

A steam leak in the drywell results in entry to the EOPs. A drywell temperature of 350°F has resulted in entry to EOP-17 and depressurization of the RPV to 80 psig. With drywell temperature at 350°F, RPV pressure at 80 psig, and drywell pressure at 5 psig RPV level indications are operating erratically. Which one of the following actions should be taken?

A. Spray the drywell.

B. Vent the drywell.

C. Flood the RPV.

D. Continue with cooldown.

96.0

Emergency Operating Procedure EOP-05, "Radioactivity Release Control", directs the operator to isolate systems discharging into secondary containment except those required to shutdown the reactor. Select the basis for this statement.

A. Isolating these systems results in inadequate core cooling.

B. Isolating these systems results in no increase of off-site releases from the discharge of these systems.

C. Isolating these systems results in the thermal degradation of safety systems due to higher energy released into primary and secondary containment.

D. Isolating these systems results in potentially higher off-site dose rates.

97.0

The plant is operating at power when an inadvertant Group 4 primary containment isolation occurs due to I&C testing. Which of the following is an expected plant response?

A. H2-O2 monitor and C-19 isolation valves shut.

B. RWCU system isolation valves shut.

C. HPCI system isolation valves shut.

D. RCIC system isolation valves shut.

98.0

Containment water level is 77 feet. Which of the following describes the status of the drywell vents and the torus to drywell vacuum breakers?

A. Both the drywell vents and the torus to drywell vacuum breakers are covered.

B. The drywell vents are covered, but the torus to drywell vacuum breakers are not.

C. The drywell vents are not covered, but the torus to drywell vacuum breakers are covered.

D. Neither the drywell vents or the torus to drywell vacuum breakers are covered.

99.0

Following a report of a steam leak on the 51' of the reactor building, the following conditions exist:

Main Stack PRM	275 cps rising slowly
RBVE PRM's	10-12 mr/hr each, steady
RWCU 51' Hx. Area Alarm on Panel 921	
Steam Leakage Alarm on 903LC	
Reactor Building Ventilation System is in Operation	
RWCU System is in Operation	

You should:

A. Initiate an RBIS, start "A" Standby Gas System, and perform radiation surveys.

B. Verify an RBIS has occurred due to the high radiation levels and perform radiation surveys.

C. Continue normal plant operation until the local area temperature exceeds the maximum safe temperature for that area.

D. Initiate an RBIS if RFVE monitors exceed 16 mr/hr.

100.0

A control rod blade for cell 20-31 was replaced during the outage. The blade is fully withdrawn with RPIS fully restored. Which one of the following will occur when loading of new fuel from the fuel pool to the core begins:

A. Fuel cannot be positioned over the core.

B. Fuel can be positioned over any core location and lowered.

C. Fuel can be positioned over any core location and be lowered to any location except that one.

D. Fuel can be positioned over the core but not lowered.

NAME: KEY

DATE: 22 Nov 1995

SRO Licensing Exam of November 22, 1995

ANSWER KEY

1.0	A	26.0	A	51.0	C	76.0	D
2.0	D	27.0	C	52.0	D	77.0	B
3.0	B	28.0	D	53.0	B	78.0	B
4.0	D	29.0	D	54.0	C	79.0	B
5.0	B	30.0	C	55.0	D	80.0	D
6.0	B	31.0	D	56.0	C	81.0	C
7.0	B	32.0	C	57.0	A	82.0	C
8.0	D/B	33.0	C	58.0	D	83.0	A
9.0	B	34.0	C	59.0	D	84.0	A
10.0	A	35.0	C	60.0	C	85.0	A
11.0	B	36.0	A/B	61.0	B	86.0	A
12.0	B	37.0	C	62.0	B	87.0	C
13.0	D	38.0	C	63.0	B	88.0	A
14.0	D	39.0	D	64.0	A	89.0	C
15.0	B	40.0	D	65.0	A	90.0	C
16.0	C	41.0	A	66.0	B	91.0	B
17.0	~~C~~ B Delete	42.0	A	67.0	A	92.0	B
18.0	C	43.0	A	68.0	C	93.0	A
19.0	DELETE	44.0	B	69.0	D	94.0	D
20.0	D	45.0	B	70.0	C	95.0	C
21.0	D	46.0	D	71.0	D	96.0	D
22.0	D	47.0	D	72.0	D	97.0	C
23.0	A	48.0	D	73.0	B	98.0	C
24.0	A	49.0	A	74.0	D	99.0	D
25.0	B	50.0	C	75.0	B	100.0	A

BOSTON EDISON RTYPE H6.05

FOR TRAINING ONLY

PILGRIM NUCLEAR POWER STATION

Procedure 5.3.28

DETERMINING TORUS AIR SPACE PRESSURE USING TORUS BOTTOM PRESSURE FOR EMERGENCY OPERATING PROCEDURES (EOPs)

EOP SUPPORT PROCEDURE CHANGES BY 1.3.4-3 ARE NOT ALLOWED

SRO #82

REQUIRED REVIEWS **AND APPROVERS**

STAR

Stop

Think

Act

Review

7/13/94
Date

7-19-94
Technical Reviewer Date

7/25/94
Validator Date

7/28/94
Procedure Owner Date

N/A
QAD Manager Date

7/28/94
ORC Chairman Date

7/25/94
Responsible Manager Date

Effective Date: 7/29/94

NESD REVIEW REQUIRED

EOP SUPPORT PROCEDURE

ORC REVIEW REQUIRED/ ~~NOT REQUIRED~~

REVISION LOG

REVISION 2	**Date Originated 6/94**
Pages Affected	Description
4-7	Add LI-1001-604A/B (for reading Torus Wide Range water level). Add PI-1001-59A/B (for reading Torus Bottom Pressure) (plant walkdown - Control Room).
Editorial 1B	**Date Originated 12/92**
Pages Affected	Description
2	Add Section 4.0 (References).
2,6	Incorporate current editorial correction identification scheme by placing "A" next to previous editorial correction's rev bars.
Editorial 1A	**Date Originated 6/91**
Pages Affected	Description
2,6	Incorporated editorial corrections to Main Control Room Panel Label nomenclature per PDC 87-78C.
REVISION 1	**Date Originated 5/90**
Pages Affected	Description
All	Reformat and Human Factors Review IAW Writers Guide.

TABLE OF CONTENTS

		Page
1.0	PURPOSE AND SCOPE	4
2.0	ACTIONS	4
3.0	DISCUSSION	4
4.0	REFERENCES	4
5.0	ATTACHMENTS	4
ATTACHMENT 1 -	TORUS AIR SPACE PRESSURE - FIGURE 1	5
ATTACHMENT 2 -	TORUS BOTTOM PRESS CORRECTION FACTOR/AIR SPACE PRESSURE CALCULATIONS - FIGURE 2	7

1.0 PURPOSE AND SCOPE

This Procedure provides instructions for:

- Determining torus air space pressure graphically using Figure 1.
- Calculating torus air space pressure mathematically using Figure 2.

2.0 ACTIONS

[1] IF torus pressure is required for use in the EOPs, **THEN READ** TORUS BOTTOM PRESS on gauge PI-1001-69A/B on Panel C903 and Torus Wide Range water level on LI-1001-604A/B on Panels C170/171.

(a) **READ** torus air space pressure from the Y-axis of Figure 1.

OR

(b) **COMPLETE** Figure 2 **AND CALCULATE** torus air space pressure.

3.0 DISCUSSION

Actions required in PNPS EOPs based on torus pressure are taken assuming the Operator is using torus air space pressure as the entry parameter. This Procedure gives the Control Room Operator two methods of determining air space pressure given that he knows Torus Bottom Pressure (PI-1001-69A/B on C903) and Torus Wide Range water level (LI-1001-604A/B on C170/171). The first method (Figure 1) is faster than the second (Figure 2) but tends not to be as accurate. The correction factor of 0.036 psi/in. is based on subcooled torus water at 70°F.

4.0 REFERENCES

[1] PNPS Plant Specific Technical Guidelines for EOPs

[2] EOP-3, *"Primary Containment Control"*

[3] EOP-17, *"Alternate Depressurization"*

[4] EOP-27, *"Alternate Depressurization, Failure to Scram"*

5.0 ATTACHMENTS

ATTACHMENT 1 - TORUS AIR SPACE PRESSURE - FIGURE 1

ATTACHMENT 2 - TORUS BOTTOM PRESS CORRECTION FACTOR/AIR SPACE PRESSURE CALCULATIONS - FIGURE 2

ATTACHMENT 1
Sheet 1 of 2

TORUS AIR SPACE PRESSURE (NARROW RANGE)

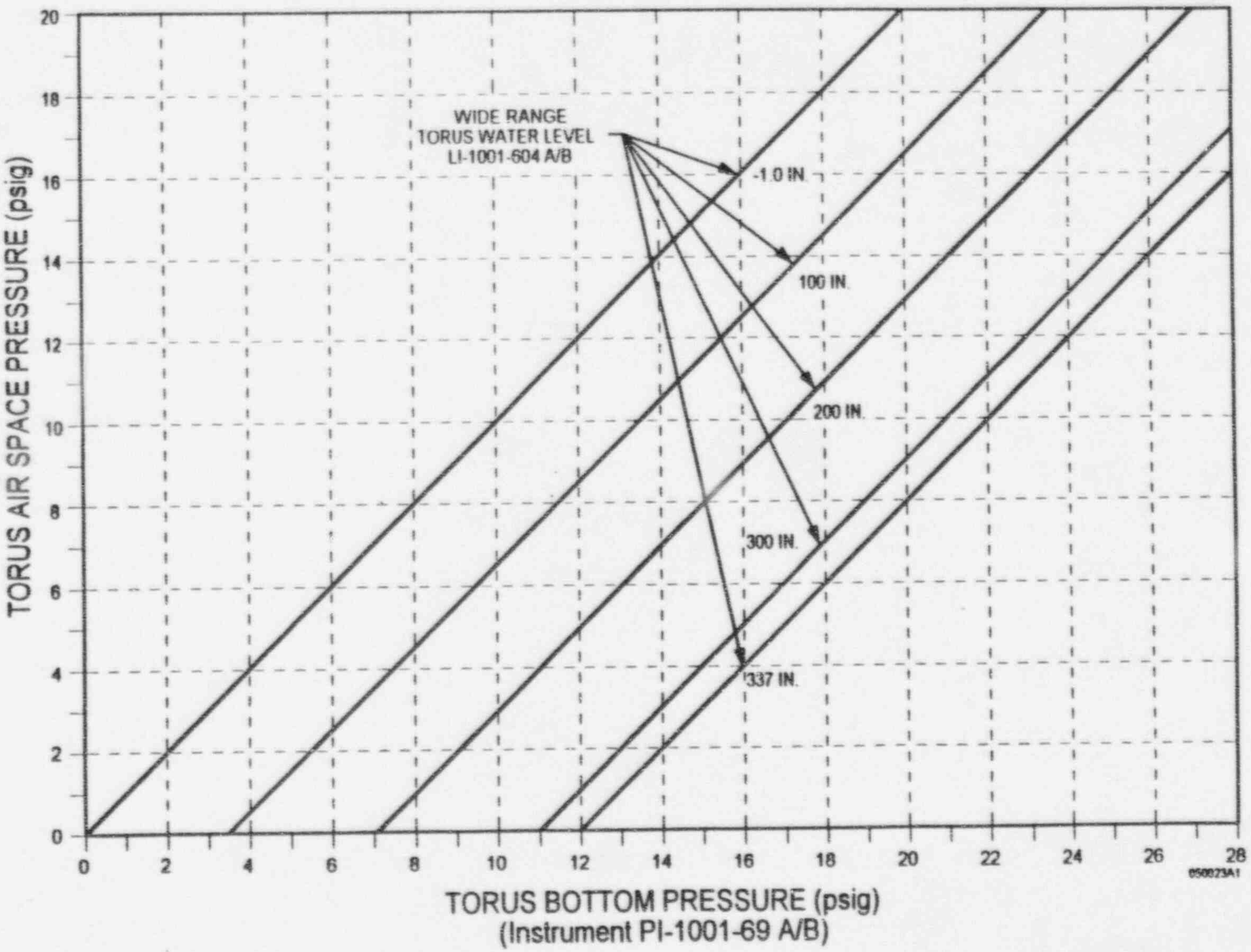


FIGURE 1

TORUS AIR SPACE PRESSURE (WIDE RANGE)

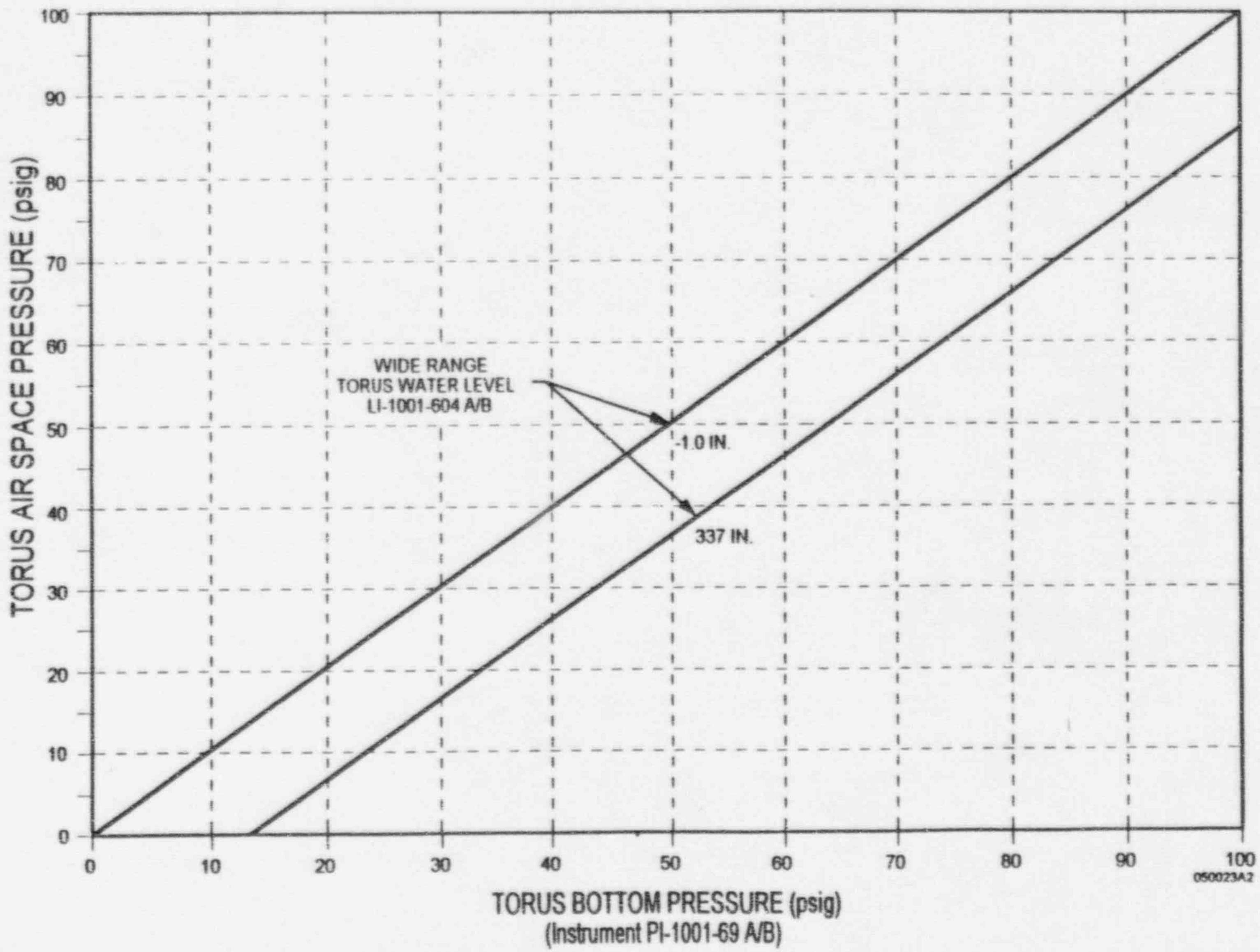


FIGURE 1 (Continued)

TORUS BOTTOM PRESSURE CORRECTION FACTOR/AIR SPACE PRESSURE CALCULATIONS

FIGURE 2

1. Enter the Torus Wide Range water level from LI-1001-604A/B (C170/C171) and calculate the Torus Bottom Pressure Correction Factor.

WIDE RANGE TORUS LEVEL (in.) LI-1001-604A/B				TORUS BOTTOM PRESSURE CORRECTION FACTOR
______________	X	0.036 psi/in.	=	______________ psi

2. Enter the Torus Bottom Pressure Correction Factor and Torus Bottom Pressure from PI-1001-69A/B (C903) and calculate the Torus Air Space Pressure.

TORUS BOTTOM PRESS PI-1001-69A/B		TORUS BOTTOM PRESSURE CORRECTION FACTOR		TORUS AIR SPACE PRESSURE
______________ psig	- (minus)	______________ psig	=	______________ psig

SRO #89-1

0800-1600 11/1/95

ATTACHMENT 1
Sheet 5 of 41

Daily Log Test #7

Once per shift the Drywell temperature will be logged when coolant temperature is above 212°F.

Drywell Air Temperature Tech Spec Table 3.2.H 4.2.H

INSTRUMENT #	LOCATION	EPIC #	
TE-5050A	86'	DRY002	143
TE-5050B	89'	DRY004	137
TE-5050C	86'	DRY006	140
TE-5050D	90'	DRY008	zero
TE-5050E	60'	DRY010	117
TE-5050F	60'	DRY012	120
TE-5050G	40'	DRY014	110
TE-5050H	40'	DRY116	115
TE-5050J	35'	DRY118	117
*TE-5050K	35'	DRY120	

* DO NOT USE - Element not connected [ERN 91-471]

Temperature shall be:

Above 40' elev., $\leq$ 189°F
Equal to or below 40' elev., $\leq$ 145°F

If the above limits are exceeded, refer to Tech Spec 3.2.H and notify NWE.

Performed by: [illegible] 1600 NWE notified: [illegible] 1600 Reviewed by: ____________

SRO#89-2

1600-2400 11/1/95

ATTACHMENT 1
Sheet 5 of 41

Daily Log Test #7

Once per shift the Drywell temperature will be logged when co[illegible] temperature is above 212°F.

Drywell Air Temperature
Tech Spec Table
3.2.H
4.2.H

INSTRUMENT #	LOCATION	EPIC #	
TE-5050A	86'	DRY002	145
TE-5050B	89'	DRY004	140
TE-5050C	86'	DRY006	138
TE-5050D	90'	DRY008	zero
TE-5050E	60'	DRY010	115
TE-5050F	60'	DRY012	118
TE-5050G	40'	DRY014	zero
TE-5050H	40'	DRY116	zero
TE-5050J	35'	DRY118	120
*TE-5050K	35'	DRY120	

* DO NOT USE - Element not connected [ERM 91-471]

Temperature shall be:

Above 40' elev., ≤ 189°F
Equal to or below 40' elev., ≤ 145°F

If the above limits are exceeded, refer to Tech Spec 3.2.H and notify NWE.

Performed by: [illegible] 1600 NWE notified: ______ Reviewed by: ______

SRO #89-3

0000-0800 11/2/95

Daily Log Test #7

Once per shift the Drywell temperature will be logged when coolant temperature is above 212°F.

Drywell Air Temperature Tech Spec Table 3.2.H 4.2.H

INSTRUMENT #	LOCATION	EPIC #	
TE-5050A	86′	DRY002	145
TE-5050B	89′	DRY004	141
TE-5050C	86′	DRY006	140
TE-5050D	90′	DRY008	zero
TE-5050E	60′	DRY010	120
TE-5050F	60′	DRY012	116
TE-5050G	40′	DRY014	zero
TE-5050H	40′	DRY116	zero
TE-5050J	35′	DRY118	125
*TE-5050K	35′	DRY120	

* DO NOT USE - Element not connected [ERN 91-471]

Temperature shall be:

Above 40′ elev., ≤ 189°F
Equal to or below 40′ elev., ≤ 145°F

If the above limits are exceeded, refer to Tech Spec 3.2.H and notify NWE.

Performed by: LJ 0400 NWE notified: ______________ Reviewed by: ______________

SRD 01 1

0800 - 1600 11/2/95

SENT BY:BECO ; 3-26-70 ; 3:55AM ; CTC→ 215 337 5320:#11

ATTACHMENT 1
Sheet 5 of 41

Daily Log Test #7

Once per shift the Drywell temperature will be logged when coolant temperature is above 212°F.

Drywell Air Temperature Tech Spec Table 3.2.H 4.2.H

INSTRUMENT #	LOCATION	EPIC #	
TE-5050A	86'	DRY002	142
TE-5050B	89'	DRY004	144
TE-5050C	86'	DRY006	147
TE-5050D	90'	DRY008	zero
TE-5050E	60'	DRY010	122
TE-5050F	60'	DRY012	119
TE-5050G	40'	DRY014	zero
TE-5050H	40'	DRY116	zero
TE-5050J	35'	DRY118	125
*TE-5050K	35'	DRY120	

* DO NOT USE - Element not connected [ERM 91-471]

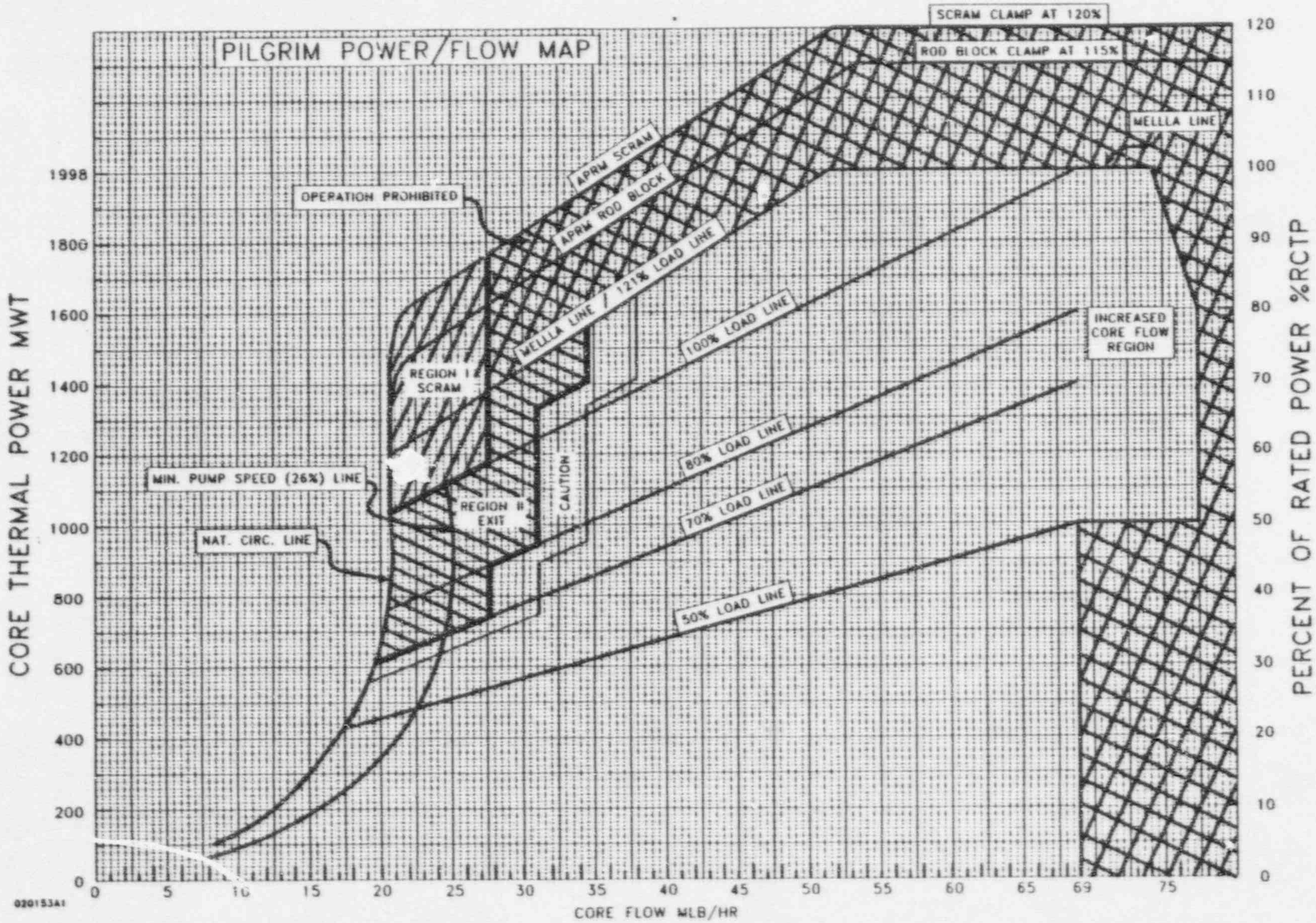
Temperature shall be:

Above 40' elev., ≤ 189°F
Equal to or below 40' elev., ≤ 145°F

If the above limits are exceeded, refer to Tech Spec 3.2.H and notify NWE.

Performed by: [illegible] 12:00 NWE notified: ____________ Reviewed by: ____________

ATTACHMENT 1
Sheet 1 of 1



ATTACHMENT 3

FACILITY COMMENTS ON WRITTEN EXAMINATIONS

RO Question
7

SRO Question
8

Written Exam Comments

for the

1995 NRC Licensing Exam

7.0

Regarding the attendant's duties for a confined space:

A. The attendant may monitor more than one adjacent permit-required confined space and may perform rounds on nearby areas.

B. The attendant may monitor more than one adjacent permit-required confined space and may not perform rounds on nearby areas.

C. The attendant may not monitor more than one adjacent permit-required confined space and may perform rounds on nearby areas.

D. The attendant may not monitor more than one adjacent permit-required confined space and may not perform rounds on nearby areas.

ANSWER:

B. & D

Plant Generic K1.14 1.4, ~~39~~ 31, page 9
N

B & D can both be Correct

RO Written Exam
Question # 7
SRO Written Exam
Question # 8

- This question is redundant to both the RO and SRO written exam.

- Answers A and C are wrong due to the fact that an attendant may have no other duties except to monitor the confined space.

- Answers B and D would both be correct under certain conditions: (See the following)

  - The term "adjacent" in each one of the answers allows for speculative assumptions on the part of the candidates.

  - Example #1 Answer B is correct
    The main condenser wateboxes are adjacent to each other with there accesses adjacent to each other (Approximately 10ft. apart).

continued on page 2

RO Question #7

SRO Question #8

(Continued)

- Example #1

An attendant would be able to maintain constant visual contact with the entrants in two (2) adjacent waterboxes and would be permitted to monitor two confined spaces simultaneously.

- Example #2 ANSWER D IS CORRECT

The firewater storage tanks are adjacent to each other (approximately 5ft. apart). However due to the location of the tanks accesses the attendant would not be able to maintain constant visual contact with the entrants inside both tanks. Therefore he would not be permitted to monitor these two confined spaces simultaneously.

- See Attached PNPS Proc. 1.4.31, pages 8 of 18 and 9 of 18, 4.0[8], [9], [10] 4.0 **RESPONSIBILITIES** (Continued)

[3] Maintenance Section (Tool Management) will maintain appropriate low voltage lights, ground fault circuit interrupters (GFCI), explosion-proof flashlights, ventilation equipment, retrieval equipment, and safety harnesses with appropriate lifelines.

[4] The Industrial Safety Group will maintain and calibrate air sampling equipment to measure oxygen, explosive atmospheres, and toxic gases or vapors. They will sample the atmosphere in the Permit-Required Confined Space to determine whether it is safe for entry. (Other trained individuals may also perform air sampling.) The Industrial Safety Group representative will prescribe the safety requirements for Permit-Required Confined Space entry, will interpret the policy, and will resolve questions that may arise.

[5] Radiological Section will provide radiological protection when applicable for Permit-Required and Non-Permit Confined Space work.

[6] The Nuclear Training and Management Services Department is responsible for training employees who may work in Permit-Required Confined Spaces.

[7] Contractors are responsible for training contractor personnel who may work in Permit-Required Confined Spaces.

[8] Attendant is responsible for the following:

(a) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

(b) Is aware of possible behavioral effects of hazard exposure in authorized entrants.

(c) Continuously maintains an accurate count of authorized entrants in the permit space and ensures that authorized entrants are identified on the permit prior to entering the space. 5

(d) Remains outside the permit space during entry operations until relieved by another attendant.

(e) Communicates with authorized entrants, as necessary, to monitor entrant status and to alert entrants of the need to evacuate the space. Communication may be via direct visual contact, voice contact, radio contact, private line, or established signals (i.e., hand signals, rope signals), etc.

4.0 **RESPONSIBILITIES** (Continued)

(f) Monitors activities inside and outside the space to determine whether it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:

(1) If the attendant detects a prohibited condition; or

(2) If the attendant detects the behavioral effects of hazard exposure in an authorized entrant; or

(3) If the attendant detects a situation outside the space that could endanger the authorized entrants; or

(4) If the attendant cannot effectively and safely perform all the duties required by Step 4.0[8].

(g) Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards. 5

(h) Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:

(1) Warn the unauthorized persons that they must stay away from the permit space.

(2) Advise the unauthorized persons that they must exit immediately if they have entered the permit space.

(3) Inform the authorized entrants and the Entry Supervisor if unauthorized persons have entered the permit space.

* [9] Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants (i.e., leaves the area outside the permit space for any reason).

* [10] Attendants may simultaneously monitor more than one Permit-Required Confined Space as long as they are located such that the attendant maintains visual contact with each one at all times.

SRO QUESTION
17

REVISED Comments

17.0

Given the following conditions after a LOCA:

- Drywell and torus pressure increases to 30 psig and then rapidly decreases to 10 psig.
- RPV level rapidly decreases to -40 inches and then slowly increases.
- RPV pressure decreases to 400 psig.
- Torus level remains in normal limits.

Which one of the following is correct in regards to Emergency Classification(s)?

A. Make classification and notifications for a Site Area Emergency.

B. Make classification and notifications for an Alert.

C. Make classification and notifications for a Site Area Emergency and immediately downgrade it to an Alert.

D. Make classifications and notifications for an Alert and immediately downgrade it to an Unusual Event.

ANSWER:

C./B

Plant Generic A1.16
P

C AND B ARE both Correct
SEE attached

SRO Written Exam
Question # 17

'C' is the correct answer based on the information provided <u>And</u> Figure 6, Pressure Suppression Pressure (PSP) Curve of the EOP's. However Fig. 6 was not provided to the candidates.
We do not require memorization of these curves, but it is possible that a candidate may have known, or used this curve recently and was able to select 'C' based on this information.

'B' is a correct answer based solely on the information provided

See Attachments

7.5 Attachment 5, Emergency Action Levels (Cont.)

3.0 PRIMARY CONTAINMENT

3.4 PRIMARY CONTAINMENT PRESSURE

General Emergency:

3.4.1.4 Torus pressure approaching "The Primary Containment Pressure Limit" (PCPL) EOP Figure 7 (prior to initiation of containment venting)

Site Area Emergency:

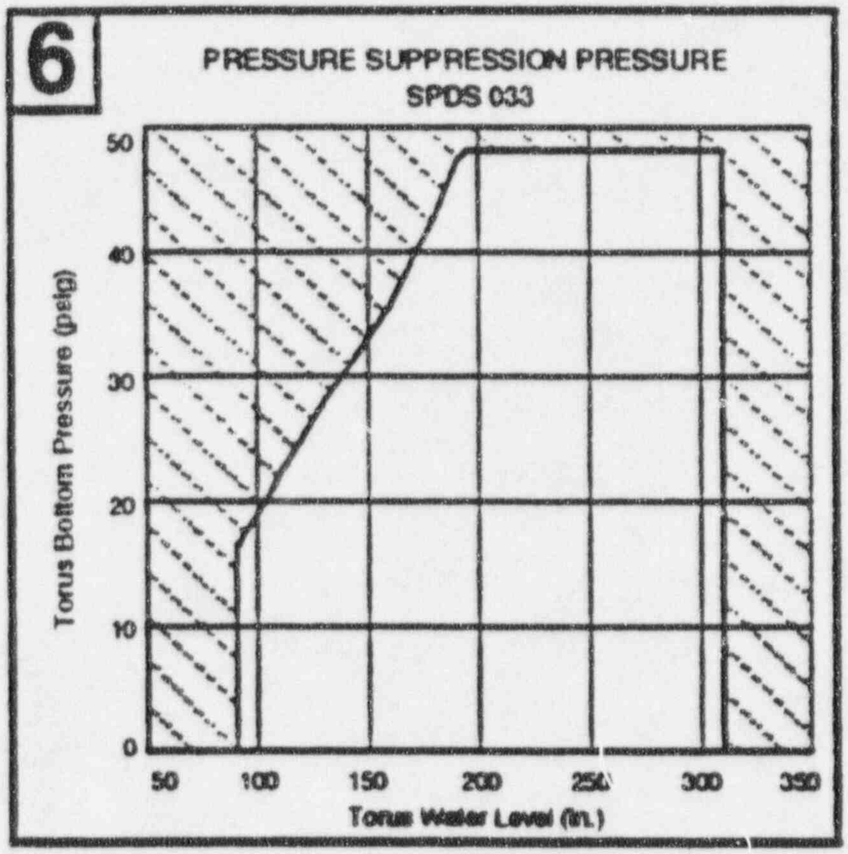
* 3.4.1.3 Torus bottom pressure cannot be maintained below the "Pressure Suppression Pressure" (PSP) EOP Figure 6 (except during testing such as ILRT, etc.)

Alert:

* 3.4.1.2 Primary containment pressure cannot be maintained < 2.2 psig (except during testing such as ILRT, etc.)

Unusual Event:

None



6

PRESSURE SUPPRESSION PRESSURE
SPDS 033

RO Question
#18

SRO Question
#19

18.0

The plant is operating at 100% power with the individual feed regulator valves in MANUAL when the feedwater flow summer fails downscale. What is the effect on plant conditions with no operator action?

A. Recirculation pump speeds remain the same and the reactor scrams on low RPV level.

B. The recirculation pumps run back to 20% speed, and the reactor scrams when the turbine trips on high level.

C. The recirculation pumps run back to 26% speed, and the reactor scrams when the MSIVs shut.

D. The recirculation pumps speed remain the same and the reactor scrams when the turbine trips on high level.

ANSWER:

C.

202002 K6.04 2.2.84
N

No Correct Answer

Delete

RO Written Exam
Question # 18
SRO Written Exam
Question # 19

- This question is redundant to both the RO and SRO written Exam.

- There is no correct answer to this question

- When the feed flow summer fails downscale the recirc pump speed control circuit receives a signal indicating less than 20% feed flow and runs back to 26% speed (See attached PNPS Proc. 2.2.84, page 12 of 93, 4.2.4 [2](d)(1).
  - Therefore answers A, B, & D are incorrect

- The MSIVs would NOT shut with the given plant conditions as long as the mode switch was in Run (See attached PNPS Proc. 2.2.92, page 8 of 46, 4.2 [1](f)
  - Therefore answer C is incorrect

- The Reactor would scram when the turbine trips on high water level due to turbine Control Valve fast closure.

RO Written Exam
Question # 18
SRO Written Exam
Question # 19

- This question is redundant to both the RO and SRO written Exam.

- There is no correct answer to this question

- When the feed flow summer fails downscale the recirc pump speed control circuit receives a signal indicating less than 20% feed flow and runs back to 26% speed (See attached PNPS Proc. 2.2.84, page 12 of 93, 4.2.4 [2](d)(1).
  - Therefore answers A, B, & D are incorrect

- The MSIVs would <u>NOT</u> shut with the given plant conditions as long as the mode switch was in <u>Run</u> (See attached PNPS Proc. 2.2.92, page 8 of 46, 4.2 [1](f)
  - Therefore Answer C is incorrect

- The Reactor would scram when the turbine trips on high water level due to turbine Control Valve fast closure.

4.2.4 System Controls and Instrumentation

PDC 94-35 was installed during RFO 10. This PDC replaced the existing Recirculation System pump speed control analog modules with integrated, programmable, digital control systems. Two independent control systems are provided, one for each Recirculation Pump. Attachment 6 contains controller display information and operation.

[1] The Digital Speed Control Stations, SIC-262-025A and SIC-262-025B, provide the means for operation in the following modes:

(a) MANUAL Control Mode - Operators have direct control of Recirculation Pump speeds.

(b) AUTOMATIC Control Mode - The control system manipulates speed demand based upon an Operator-controlled setpoint and the pump speed feedback signal.

The AUTOMATIC to MANUAL mode can be changed by depressing the A/M push button on the keypad. The appropriate letter designation will be displayed next to the bar graphs. Recirc Pump starts will be performed in the MANUAL mode. Operation in the AUTOMATIC mode will be at the discretion of the NWE.

[2] The "SPEC 200 MICRO" is the microprocessor-controlled, programmable, digital system which replaces all of the old analog modules in Panel C918. Although many of the devices are replaced, the Recirculation System has experienced only minor changes operationally.

Microprocessor SY-262-25A/B feeds the following components:

(a) Pump speed/input to scoop tube signal to SI-262-37A/B on Panel C904

(b) Scoop tube positioner signal to 0202-51A/B

(c) Startup Generator Signal:

(1) Overrides the Speed Limiter #1 and controller outputs and supplies a fixed speed demand signal of 53% to the scoop tube during pump starts.

(d) Speed Limiter No. 1:

* → (1) When feedwater flow is less than 20% of rated **OR** the respective Recirculation Pump's discharge valve is not fully open, the Speed Limiter #1 function will override controller output and will limit the speed demand signal to 26%.

(e) Speed Limiter No. 2:

(1) When Reactor feedwater level is less than +19" (low level alarm point) **AND** less than three Reactor Feed Pumps are running, the Speed Limiter No. 2 function will override controller output and will limit the speed demand signal to 44%, not subject to rate limiting.

4.2 AUTOMATIC RESPONSE AND INTERLOCKS

[1] All Main Steam Isolation Valves close automatically on receipt of any of the following signals. The valve closure times will not be greater than 5 seconds nor less than 3 seconds.

(a) Reactor low-low water level (-46.4 in.)

(b) Main steam line high flow (136% of rated steam flow)

(c) Main steam line tunnel exhaust duct high temperature (170°F)

(d) Turbine basement exhaust duct high temperature (150°F)

(e) Main steam line low pressure (with mode switch in "RUN") (810 psig)

* → (f) Reactor vessel HI (+55.4 in.) level when mode switch not in "RUN" and main steam line pressure less than 810 psig.

[2] The turbine bypass valves open automatically to control steam pressure when the steam pressure exceeds the pressure regulator setpoint provided the auxiliary oil or turbine attached oil pump is running and #2 vacuum trip is reset when the condenser vacuum is greater than 7" Hg.

5.0 PRECAUTIONS AND LIMITATIONS

5.1 PRECAUTIONS

[1] Open the outboard MSIVs prior to opening the inboard MSIVs to allow the trapped condensation to drain. Do not attempt to open the MSIVs with a pressure differential across the valve greater than 200 psi. The "recommended" pressure differential is less than or equal to 50 psi across the valve.

[2] Once an isolation is automatically initiated, the valve continues to close even if the condition that caused it is restored to normal. The Operator must operate the isolation reset in the Control Room to reopen an isolation valve that automatically closed. The Operator cannot reset the isolation until the condition causing the isolation is cleared. PLACE THE CONTROL SWITCHES FOR THE MSIVs IN "CLOSE" PRIOR TO RESETTING THE ISOLATION SIGNAL.

[3] The turbine bypass valve opening jack will take control away from the initial pressure regulator. The turbine bypass valve opening jack will operate either the bypass or control valves depending on the position of the load limit and/or speed load changer.

[4] If the reactor pressure is allowed to exceed 576 psig with the REACTOR MODE switch in "SHUTDOWN, "REFUEL", or "STARTUP", with the Main Steam Isolation Valves closed, a reactor Scram will result.

RO Question
36

SRO Question
36

36.0

While at 90% power, an SRV opens. Which statement is correct concerning indicated steam flow and RPV level.

A. Steam flow decreases, RPV level decreases.

B. Steam flow decreases, RPV level increases.

C. Steam flow increases, RPV level decreases.

D. Steam flow increases, RPV level increases.

ANSWER:

A. / B

259002
N

A & B ARE both Correct

RO Written Exam
Question # 36

SRO Written Exam
Question # 36

- This question is redundant to both the RO and SRO Exam.

- Answer 'A' is correct when plant conditions stabilize, approximately 1½ to 2 minutes after the SRV opens.

- Answer 'B' is correct when the SRV initially opens.

- These answers were verified on the PNPS Simulator with the following indications:
  - SRV Opens (Time - 0) Steam flow decreases ≈ 800,000 lbm/hr and Rx water level swells ≈ 2 inches above the pre-transient level.
  - SRV Open (Time - 2 min.) Steam flow remains ≈ 800,000 lbm/hr less than rated flow and Rx water level lowers to ≈ 2 inches below the pre-transient level.

RO Question
42

SRO Question
44

42.0

The plant is operating at 70% with only "A" reactor recirculation pump running. Which ONE of the following conditions represents the plant status?

A. "B" jet pump flow is reverse, indicated core flow is the same as actual core flow.

B. "B" jet pump flow is reverse, indicated core flow is greater than actual core flow.

C. "B" jet pump flow is forward, indicated core flow is the same as actual core flow.

D. "B" jet pump flow is forward, indicated core flow is greater than actual core flow.

ANSWER:

~~A.~~

Answer B

202001 K1.01
PR

B. is the Correct Answer

A. was a typographical error

RO Written Exam
Question # 42

SRO Written Exam
Question # 44

- This question is redundant to both the SRO and the RO written Exam.

- A typographical error was made during final type

- B is the correct answer

RO Question
#61

61.0

Given the following:

Reactor Power	80%
Total Core Flow	48.3 Mlb/hr.
'A' Recirc Loop Flow	62%
'B' Recirc Loop Flow	58%

What is the scram setpoint of APRM E?

A. 102.6

B. 97.96

C. 96.8

D. 95.64

ANSWER:

C.

No correct ANSWER
(108.6 = .66w + 69%)

215005 K5.05
N

R.O. Written Exam

Question #61

- The Correct answer for the given plant Conditions is 108.6.

- This is calculated IAW the Core Operating Limits Report for Pilgrim Station, Rev. 11A, page 7 of 25 (attached) using the following formula:

$$S_s \leq 0.66\,w + 69\%$$

$$\leq .66\left(\frac{62+58}{2}\right) + 69$$

$$108.6 \leq .66(60) + 69$$

2.0 INSTRUMENTATION TRIP SETTINGS:

2.1 APRM Flux Scram Trip Setting (Run Mode)

Reference Technical Specifications: Table 3.1.1, 3.1.B.1

When the mode switch is in the run position, the average power range monitor (APRM) flux scram trip setting (S_s) shall be:

$$S_s \leq \quad 0.66\ W + 69\%$$

with a clamp at 120% of rated core thermal power and

S_s = APRM flux scram trip setting in percent of rated thermal power (1998 MW_t).

W = Percent of drive flow required to produce a rated core flow of 69 Mlb/hr.

The APRM flux scram trip setting is valid only for operation using two recirculation loops. Operation with one recirculation loop out of service is restricted by License Condition 3.E.

In accordance with Technical Specification Table 3.1.1, Note 15, for no combination of loop recirculation flow rate and core thermal power shall the APRM flux scram trip setting be allowed to exceed 120% of rated thermal power.

2.2 APRM Rod Block Trip Setting (Run Mode)

Reference Technical Specifications: Table 3.2.C-2, 3.1.B.1

When the mode switch is in the run position, the average power range monitor (APRM) rod block trip setting (S_{RB}) shall be:

$$S_{RB} \leq \quad 0.66\ W + 62\%$$

with a clamp at 115% of rated core thermal power and

S_{RB} = APRM rod block trip setting in percent of rated thermal power (1998 MW_t).

W = Percent of drive flow required to produce a rated core flow of 69 Mlb/hr.

ATTACHMENT 4

NRC RESOLUTION OF FACILITY COMMENTS ON WRITTEN EXAMINATION

RO-7, SRO-8	Accept the facility comment. Revise answer key to accept B and D.
SRO-17	Accept the facility comment that a reference was required. However, based on the question asked the applicants needed the reference to correctly answer the question. Since the applicants were not provided the required reference, the question should be deleted from the examination.
RO-18, SRO-19	Accept the facility comment. Delete the question from the examination.
RO-36, SRO-36	Accept the facility comment. Revise answer key to accept A and B.
RO-42, SRO-44	Accept the facility comment. Revise answer key to B.
RO-61	Accept the facility comment. Delete the question from the examination.

ATTACHMENT 5

SIMULATION FACILITY REPORT

Facility License: DPR-35

Facility Docket No: 50-293

Operating Test Administration: November 27-December 1, 1995

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

ITEM	DESCRIPTION
None	

38.0

A loss of coolant (LOCA) has occurred in conjunction with a failure of off-site power. WHICH ONE of the following states the sequence of equipment automatically started after both emergency diesel generators start?

A. The first two residual heat removal (RHR) pumps, then the core spray pumps, then the turbine building closed cooling water (TBCCW) pump "A", then the second two RHR pumps, then the salt service water (SSW) pump "A".

B. The first two RHR pumps, then the second two RHR pumps, then the core spray pumps, then the TBCCW pump "A" and the SSW "A" pump.

C. Core spray pumps, then the first two RHR pumps, then the second two RHR pumps, then the TBCCW pump "A" and the SSW "A" pump.

D. Core spray pumps, then the first two RHR pumps, then the SSW "A" pump, then the second two RHR pumps, then the TBCCW pump "A".

39.0

WHICH ONE of the following describes the effect of a mechanical failure of the vital bus motor generator set?

A. Power to the vital bus loads is lost; manual switching is required to resupply power to the vital bus from bus 15.

B. Power to the vital bus loads is lost; manual switching is required to resupply power to the vital bus from bus 14.

C. Power to the vital bus loads is restored; automatic switching supplies power to the vital bus from bus 14.

D. Power to the vital bus loads is restored; automatic switching supplies power to the vital bus from bus 15.

40.0

After an operator locally investigates "A" diesel generator, it's reported that the diesel overcrank annunciator is present. Which of the following could cause this condition to exist?

A. Lube oil high temperature shutdown.

B. Jacket water high temperature shutdown.

C. Emergency stop switch is OFF.

D. Fuel oil filters are clogged.

41.0

When resetting a scram, it is necessary to place the Air Dump System Test Switch to the "ISOLATE" position. Why is this required?

A. The "Isolate" position shifts the SPVAH dump valve air supply point allowing the SPVAH dump valve to reset and the SPVAH to repressurize.

B. The "Isolate" position supplies air to close the scram pilot valves which then allows the SPVAH to repressurize the SPVAH dump valve.

C. The "Isolate" position isolates the SPVAH which allows the scram pilot valves to close.

D. The "Isolate" position supplies air to close the backup scram valves which then allows the SPVAH to repressurize.

42.0

When starting up following a refueling outage, a group of control rods is at position 32 when the plant reaches 100% power. Coupling integrity on these rods is verified by:

A. Verifying nuclear instrument response with these control rods during the startup.

B. Verifying RPIS indication changes as each rod is withdrawn.

C. Withdrawing each rod to position "48" to verify coupling, then returning it to its required position prior to exceeding 25% power.

D. No coupling check is required on these rods when power is greater than 25%.