U. S. NUCLEAR REGULATORY COMMISSION REGION I
OPERATOR LICENSING EXAMINATION REPORT

Report No.	50-293/91-25 (OL)
Facility Docket No.	50-293
Facility License No.	DPR-35
License:	Boston Edison Company RFD #1 Rocky Hill Road Plymouth, Massachusetts 02360
Facility:	Pilgrim Nuclear Power Station
Examination Dates:	December 2 - 6, 1991
Examiners:	T. Bettendorf, Examiner, PNL. P. Bonnett, Senior Operations Engineer A. Burritt, Operations Engineer R. Conte, Chief, BWR Section, DRS S. Stewart, Operations Engineer

Chief Examiner: _____ 1/10/92
F. Paul Bonnett, Sr. Operations Engineer — Date
BWR Section, Operations Branch
Division of Reactor Safety

Approved By: _____ 1/10/92
Richard J. Conte, Chief, BWR Section — Date
Operations Branch
Division of Reactor Safety

Examination Summary: Written examinations and operating tests were administered to three (3) Senior Reactor Operator-Instant (SRO-I) candidates, and six (6) Reactor Operator (RO) candidates. All of the candidates passed the examinations, and the examiners noted continued good preparedness by the applicants at this facility for NRC initial examinations. Strengths and weaknesses were identified as feedback to the licensee's training program.

During the verification of the simulator and in-plant Job Performance Measures (JPM's), several discrepancies between the facility JPM's and the procedures or within the procedures were noted. Additional time was needed during this verification process because of the need to ensure that all of the JPM's were correct.

Further, the examiners noted that no procedural guidance existed for the operator to account for forward (positive) flow through idle jet pumps during a return to two loop operation from single loop operations. One candidate calculated recirculation flow incorrectly due to the lack of this technical information in the procedure.

Also, minor material condition problems were noted in the plant during the plant walk-through portion of the examination. The applicants properly reported these conditions to the control room for corrective action.

DETAILS

1.0 INTRODUCTION

The NRC examiners administered initial examinations to three (3) Senior Reactor Operator-Instant (SRO-I) candidates and six (6) Reactor Operator candidates. The examinations were administered in accordance with NUREG 1021, Examiner Standards, Rev. 6, dated June 1, 1990. The results of the examination are summarized below.

	RO	SRO-I
Written	6/6	3/3
Operating	6/6	3/3
Overall	6/6	3/3

2.0 PERSONS CONTACTED

2.1 U.S. Nuclear Regulatory Commission

* T. Bettendorf, Examiner, PNL
* P. Bonnett, Senior Operations Engineer
* A. Burritt, Operations Engineer
* R. Conte, Chief, BWR Section, DRS
J. Munro, Operator Licensing Branch
* S. Stewart, Operations Engineer

2.2 Boston Electric Company

* J. Alexander, Training Manager
* R. Anderson, Vice-President Operations
* W. Green, Sr. Nuclear Training Specialist
* E. Kraft, Plant Manager
* W. Munro, Jr. Compliance Engineer
* L. Olivier, Operations Section Manager
* A. Shiever, Ops Training Supervisor
* T. Sullivan, Chief Operating Engineer

* Denotes those present at the exit interview on December 6, 1991.

3.0 PREEXAMINATION ACTIVITIES

3.1 License Application Review

The license applications were reviewed in accordance with NUREG 1021, Examiner Standards, Rev. 6. The applications contained sufficient information to determine the eligibility of the applicants for the examination.

3.2 Preexamination Review

The facility reviewed the written examinations on November 21, 1991, at the Region I office. The review team consisted of the Operations Training Supervisor, the Chief Operating Engineer and a Senior Nuclear Training Specialist. All facility comments were discussed, resolved, and validated during the review session. The examination was revised to incorporate those changes. All facility individuals involved with the review of the examination signed security agreements to ensure that there was no compromise of the examination.

3.3 Simulator Examination Validation and Verification

All simulator examination scenarios and JPMs used for the RO/SRO operating tests were validated and verified at the facility simulator on December 2 - 3, 1991. All facility individuals involved with the validation and verification signed security agreements to insure that there was no compromise of the examination.

4.0 EXAMINATION-RELATED FINDINGS AND CONCLUSIONS

4.1 The following is a summary of the strengths and deficiencies noted during the administration of the written examination and operating tests. This information is being provided to aid the licensee in upgrading license and requalification training programs. No licensee response is required.

Strengths

a. Individual and crew communications were good.

b. Procedure usage by the candidates was good.

c. Good teamwork was demonstrated by the candidates.

d. All candidates demonstrated good operator skills during the simulator and walk-through exams.

e. Candidates possessed a good knowledge of system operation and design.

Deficiencies

a. The RO candidates did not routinely call for process computer print-outs (OD-3 or P-1) to monitor reactor power while ascending or descending in power.

b. RO candidates need to offer containment parameter information to the SRO during EOP events without it always being requested.

c. The candidates were not aware that the key located at each Alternate Shutdown Panel (ASP) was a common key to all ASP locations.

d. The Scram Discharge Volume (SDV) Vent and Drain Valve indications are not verified shut during the post-scram actions.

4.2 Training Program Comments

Many facility-generated JPM's were used by the examination team for the operating test. During the verification of the simulator and in-plant JPM's, several discrepancies between the JPM's and the procedures were noted. The JPM's required moderate to major modification's to make them correct. The facility completely re-wrote two of the JPM's that the examination team had selected. Due to the need to ensure all of the JPM's were correct, a great deal of time was spent during this verification process. The JPM process has been a benefit in enhancing procedure adequacy.

The Training Department teaches the operators certain actions that should be taken for post-scram Reactor Pressure Vessel level control during an Anticipated Transient Without Scram (ATWS)/Non-ATWS event, and for maximizing drywell cooling. These actions are not found in any procedure, but are policies verbally communicated from the Operations management to Training. These actions are numerous, involve stopping and re-starting large pumps and fans, and vary depending upon the situation. Presently, these policies are disseminated in Emergency Operating Procedure lesson plans and by the instructor during simulator training. The normal method of publishing Operations policies is in the Night Order and Standing Order Books. Licensee representatives indicated that such policies were being formalized into facility procedures/instructions, as appropriate. They also acknowleged that training is not the proper means of declaring operations policy, but the medium for re-enforcing that policy.

The two RO crews were trained and were to be examined with two Training Instructors standing-in as the Nuclear Operations Supervisor (NOS). Due to an unforseen health problem, one of the NOS stand-ins was not able to participate in the simulator operating test. Training management offered four alternative plans. The

Chief Examiner accepted a plan having the Operations Training Supervisor stand-in as the NOS. The Operations Training Supervisor agreed that he would not be present in the simulator during the validation of the RO scenarios.

Simulator Fidelity problems are noted in Attachment 4 and were discussed with licensee representatives.

Overall, the applicants were well prepared for the licensing examinations. Licensee provided reference materials were adequate and in accordance with the NRC's 90-day letter. Certain information that was requested after receipt of the reference material was forwarded expeditiously.

4.3 Additional Findings

During the administration of the operating test, the NRC examination team identified the following plant and procedure findings.

An illegible Caution Tag hanging on the fan control switch for the RCIC Quadrant Fan was identified during an in-plant walk-through. The candidate checked the tag log and found it to be incorrectly filled out. The log entry was corrected and a new tag issued.

The position indicator for valve HO-1279-38A, C.U. Filter Demin A Precoat Return Valve, located at the Reactor Water Clean-up Precoat Station was found to be broken. The candidate immediately and properly reported this item to the control room.

A leak at the B Standby Liquid Control Pump station was noted. A Work Request Tag dated April 5, 1991, was hung on the pipe identifying the leak. However, no work to repair the leak was evident. The candidate immediately and properly reported this item to the control room.

No procedural guidance exists for the operators to account for forward (positive) flow through idle jet pumps during a return to two loop operation from single loop operation. This was identified during a JPM in which a candidate was attempting to calculate total core flow and determined that he was in a restricted region of the Power-Flow Map. The candidate had lowered the operating pump speed to 35% as directed by the procedure. Idle recirculation loop flow had turned from negative to positive, due to less driving force in the idle loop. The Examiner was informed that technical information provided by General Electric specified that at flows less than 40 MLB/HR, recirculation flow in the idle loop is actually positive and, therefore, additive. However, the procedure did not address this. The candidate would not have calculated recirculation flow incorrectly had the procedure reflected this technical information.

5.0 EXIT INTERVIEW

An exit meeting was conducted on December 6, 1991. The licensee representatives who attended the meeting are listed in section 2.2 of this report.

The Operations personnel were cooperative. There were no problems with access to the plant. Generic strengths and weaknesses from the examination, simulator fidelity problems, and other findings discussed in this report were presented. The facility acknowledged the NRC comments and stated that they thought the examination was comprehensive with a good focus on safety and operations.

It was explained by the examiners that the results of the examinations would not be presented at the exit meeting but would be contained in the Examination Report. Every effort would be made to send the applicant's results in approximately 30 working days.

Attachments:

1. Reactor Operator Examination and Answer Key
2. Senior Reactor Operator Examination and Answer Key
3. Facility Comments and NRC Response
4. Simulator Fidelity Report

Attachment 1

Reactor Operator Examination

and Answer Key

U. S. NUCLEAR REGULATORY COMMISSION
SITE SPECIFIC EXAMINATION
REACTOR OPERATOR LICENSE
REGION 1

CANDIDATE'S NAME: MASTER

FACILITY: Pilgrim 1

REACTOR TYPE: BWR-GE3

DATE ADMINISTERED: 91/12/02

INSTRUCTIONS TO CANDIDATE:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

TEST VALUE	CANDIDATE'S SCORE	%	
99.00 B ~~100.00~~ 12-9-91		____%	TOTALS
	FINAL GRADE		

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

Candidate's Signature

A N S W E R K E Y

MULTIPLE CHOICE

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

A N S W E R K E Y

046	d	069	d
047	b	070	c
048	a	071	c
049	a	072	d
050	b	073	c
051	b	[illegible]	a
052	c	[illegible]	a
053	b	076	b
054	b	077	c
055	c	078	c
056	a	079	d
057	c	080	d
058	a	081	d
059	b	082	d
060	b	083	c
061	a	084	d
062	a	085	a
063	d	086	b
064	a	087	d
065	a	088	b
066	c	089	d
067	d	090	a
068	a	091	b

A N S W E R K E Y

092 a

093 d

094 d

095 d

096 d

097 a

098 c

099 ~~a~~ b

100 a

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

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

046	a	b	c	d	___	069	a	b	c	d	___
047	a	b	c	d	___	070	a	b	c	d	___
048	a	b	c	d	___	071	a	b	c	d	___
049	a	b	c	d	___	072	a	b	c	d	___
050	a	b	c	d	___	073	a	b	c	d	___
051	a	b	c	d	___	074	a	b	c	d	___
052	a	b	c	d	___	075	a	b	c	d	___
053	a	b	c	d	___	076	a	b	c	d	___
054	a	b	c	d	___	077	a	b	c	d	___
055	a	b	c	d	___	078	a	b	c	d	___
056	a	b	c	d	___	079	a	b	c	d	___
057	a	b	c	d	___	080	a	b	c	d	___
058	a	b	c	d	___	081	a	b	c	d	___
059	a	b	c	d	___	082	a	b	c	d	___
060	a	b	c	d	___	083	a	b	c	d	___
061	a	b	c	d	___	084	a	b	c	d	___
062	a	b	c	d	___	085	a	b	c	d	___
063	a	b	c	d	___	086	a	b	c	d	___
064	a	b	c	d	___	087	a	b	c	d	___
065	a	b	c	d	___	088	a	b	c	d	___
066	a	b	c	d	___	089	a	b	c	d	___
067	a	b	c	d	___	090	a	b	c	d	___
068	a	b	c	d	___	091	a	b	c	d	___

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

092	a	b	c	d	___
093	a	b	c	d	___
094	a	b	c	d	___
095	a	b	c	d	___
096	a	b	c	d	___
097	a	b	c	d	___
098	a	b	c	d	___
099	a	b	c	d	___
100	a	b	c	d	___

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

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 applicant 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 and each answer sheet.

6. Mark your answers on the answer sheet provided. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

7. 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.

8. 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.

9. The point value for each question is indicated in parentheses after the question.

10. Show all calculations, methods, or assumptions used to obtain an answer to any short answer questions.

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

12. 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.

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

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

15. Ensure all information you wish to have evaluated as part of your answer is on your answer sheet. Scrap paper will be disposed of immediately following the examination.

16. To pass the examination, you must achieve a grade of 80% or greater.

17. There is a time limit of four (4) hours for completion of the examination.

18. When you are done and have turned in your examination, leave the examination area (EXAMINER WILL DEFINE THE AREA). If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION: 001 (1.00)

WHICH ONE of the following is a concern associated with increasing fuel pool temperature?

a. Increased airborne radioactivity.

b. Stored fuel overheating damage.

c. Fuel pool structural damage.

d. Indicates criticality.

QUESTION: 002 (1.00)

WHICH ONE of the following methods must be used when performing an independent verification of a tagout for a deenergized valve that is inaccessible?

a. Rack in its associated breaker and verify the position using remote indication.

b. The NOS log book is the official record of valve position and used for verifying valve position.

c. If the valve is associated with an system line-up procedure, the previous system line-up procedure can be used to verify valve position.

d. For valves that are associated with an existing Tagout, the existing Tagout can be used to verify valve position.

QUESTION: 003 (1.00)

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.

QUESTION: 004 (1.00)

WHICH ONE of the following statements describes a ALERT emergency level classification event?

a. Events that involve major failures of plant functions needed for public protection and a likely release of radioactive material.

b. Events that involve a substantial degradation of the level of safety of the plant with no offsite release expected.

c. Events that involve core degradation with possible loss of containment.

d. Events that indicate a potential degradation of the level of safety of the plant.

QUESTION: 005 (1.00)

WHICH ONE of the following contains the minimum radiation level that require a Regular or Extended Radiation Work Permit (RWP)?

a. 1 Rem/hr

b. .1 Rem/hr

c. .01 Rem/hr

d. .001 Rem/hr

QUESTION: 006 (1.00)

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

SELECT the statement that describes the operating concerns of the CRD pump.

a. The pump cannot be operated except at the request of the permit holder.

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.

QUESTION: 007 (1.00)

WHICH ONE of the following PNPS emergency alarms is associated with an Emergency Site Evacuation?

a. Siren

b. Fast Warble

c. High Continuous Pitch

d. Fast Beep

QUESTION: 008 (1.00)

PNPS lead shielding program requirements are established under the supervision of ...

a. Maintenance personnel

b. ALARA engineers

c. NWE and staff

d. QA personnel

QUESTION: 009 (1.00)

A radiological survey of an area has the following results:

- 51 mrem/hr general radiation
- 125 dpm/100 cm2 loose surface
- 15 dpm/100 cm2 loose surface alpha
- .18 mpc airborne concentrations

Based on the survey results, WHICH ONE of the following states the COMPLETE posting(s) required?

a. Contamination Area

b. Radiation Area

c. Airborne Radioactivity Area.

d. High Radiation Area.

QUESTION: 010 (1.00)

WHICH ONE of the following identifies ONLY those individuals that are authorized to escort visitors at PNPS?

a. Any PNPS employee who is permanently badged.

b. Any PNPS employee who has received General Employee Training.

c. Any PNPS employee who has a security badge with a yellow background.

d. Any PNPS employee who has been approved by security.

QUESTION: 011 (1.00)

During a plant outage a fire in the drywell develops. You are a member of the fire brigade reporting to the scene. WHICH ONE of the following is considered to be one of your immediate actions?

a. Notify Radiological Protection management and ensure that they will be assisting the Fire Brigade.

b. Request that Security personnel activate the Radiax Communication System.

c. Clear cords, and any equipment not used for fire fighting from all hatches.

d. Dispatch a Nuclear Plant Operator to the Intake Structure to monitor fire pump performance.

QUESTION: 012 (1.00)

Procedure 5.3.21, "Bypass Selected Interlocks," is used under emergency conditions when normal control systems have failed. SELECT the person whose authorization is specifically required prior to installing a bypass jumper.

a. The SCRE

b. The STA

c. The NOS

d. The NWE

QUESTION: 013 (1.00)

WHICH ONE of the following states the MINIMUM reactor water conductivity level that would require an orderly reactor shutdown?

a. 11 umhos/cm

b. .1 umhos/cm

c. 10 ppb

d. .1 ppm

QUESTION: 014 (1.00)

The reactor has scrammed due to a loss of level and EOP-01 (RPV CONTROL) has been entered. During the execution of EOP-01, a high drywell pressure entry condition occurs. WHICH ONE of the following actions should be taken?

a. Enter EOP-04, Secondary Containment Control AND EOP-03, Primary Containment Control.

b. Finish execution of the EOP-01, RPV Control, THEN enter EOP-03, Primary Containment Control.

c. Re-enter EOP-01, RPV Control AND enter EOP-03 Primary Containment Control.

d. Exit EOP-01, RPV Control, THEN enter EOP-03, Primary Containment Control.

QUESTION: 015 (1.00)

SELECT the thermal limit that is the ratio of actual bundle power to the bundle power that is required to produce 25 degree temperature swings within the bundle.

a. APLHGR

b. MCPR

c. MAPRAT

d. FLPD

QUESTION: 016 (1.00)

WHICH ONE of the following completes the statement below?

The backup scram valves are ____(1)____ powered solenoid valves; and these solenoid valves _____(2)_____ to isolate and vent off the scram air header.

a. (1) 125 VDC; and (2) deenergize.

b. (1) 125 VDC; and (2) energize.

c. (1) 120 VAC; and (2) deenergize.

d. (1) 120 VAC; and (2) energize.

QUESTION: 017 (1.00)

WHICH ONE of the following is a an accurate response for filling in the blanks?

The minimum number of RPS CHANNEL TRIPS required to cause a FULL SCRAM is _____(1)_____.

The minimum number of BACKUP SCRAM VALVES needed to cause a FULL SCRAM is _____(2)_____.

a. (1) ONE, (2) ONE.

b. (1) ONE, (2) TWO.

c. (1) TWO, (2) ONE.

d. (1) TWO, (2) TWO.

QUESTION: 018 (1.00)

If the Reactor Manual Control (RMC) master timer fails, the RMC system interlock that prevents uncontrolled rod withdrawal using the Rod Movement Control Switch ONLY, is accomplished by ...

a. generating a Select Block, if the withdrawal portion of the sequence lasts for two or more seconds.

generating a Withdrawal Block, if the withdrawal portion of the sequence last more than 1.5 seconds.

. the auxiliary timer generates an Insert Block if the notch sequence last longer than 2 seconds.

d. the automatic sequence timer will generate both an Insert and Withdrawal Block after 1.5 seconds.

QUESTION: 019 (1.00)

WHICH ONE of the following describes how an emergency diesel generator would be effected if its four isolation switches, located in the alternate shutdown panel, were placed in the "LOCAL" position.

a. Isolates the remote DG fuel pump start function.

b. Locks the DG in the isochronous mode.

c. Remove the voltage regulator auto function.

d. Cut out all diesel automatic shutdowns except low oil level and overspeed.

QUESTION: 020 (1.00)

WHICH ONE of the following methods is used to maintain the High Pressure Coolant Injection (HPCI) System piping full of water in its normal operational line up?

a. The hydrostatic head from the torus.

b. The hydrostatic head from the condensate storage tank (CST).

c. The discharge pressure from the ECCS Keep Fill Pump.

d. The discharge pressure from the condensate transfer pumps.

QUESTION: 021 (1.00)

WHICH ONE of the following describes the expected effects on reactor level indication if elevated temperatures exist in the drywell?

a. There is no expected change for the wide range and FWLC narrow range.

b. Higher than actual level indications on the FWLC narrow range.

c. Lower than actual level indications on the FWLC narrow range.

d. Lower than actual level indications on the wide range and FWLC narrow range.

QUESTION: 022 (1.00)

The High Pressure Coolant Injection (HPCI) Turbine has isolated from a faulty low steam supply pressure signal. An automatic HPCI initiation signal due to high drywell pressure then occurs. If the turbine isolation condition clears, while the drywell pressure is still high, what is the method of resetting the HPCI Turbine for restart?

a. Depressing the RESET button on the 903 panel and manually opening Valve 2301-4.

b. Depressing the RESET button on the 903 panel and valve 2301-4 opens automatically.

c. Allowing the turbine trip to reset automatically and manually opening valve 2301-4.

d. Allowing the turbine trip to reset automatically and valve 2301-4 opens automatically.

QUESTION: 023 (1.00)

Given the plant conditions, WHICH ONE of the following completes the statement below?

PLANT CONDITIONS

- Loss of Coolant Accident (LOCA) is in progress,
- High Pressure Coolant Injection (HPCI) initiation signal present,
- Condensate Storage Tank (CST) level is 25 inches above tan zero,
- suppression pool level is +6.5 inches,
- reactor pressure is 105 psig.

The HPCI Steam Supply Isolation Valves, 2301-4 and 2301-5, automatically ___(1)___, the Torus Suction Valves, 2301-35 and 2301-36 automatically ___(2)___, the CST Suction Valve, 2301-6, automatically ___(3)___.

a. (1) open if closed, (2) open, (3) closes.

b. (1) close if open, (2) open, (3) closes.

c. (1) close if open, (2) close, (3) closes.

d. (1) open if closed, (2) close, (3) opens.

QUESTION: 024 (1.00

The purpose of the Standby Liquid Control (SBLC) Pump Discharge Accumulator is to...

a. provide a means of injection during a failure of both SBLC pumps.

b. prevent spurious operation of the discharge relief valves when both pumps are running.

c. minimize pulsations in system discharge pressure.

d. ensure sodium pentaborate remains suspended in solution.

QUESTION: 025 (1.00)

WHICH ONE of the following RPS scram signals is ACTIVE when the reactor mode switch is in the STARTUP Position.

a. APRM high flux (flow biased).

b. APRM downscale with companion IRM high.

c. Low MHC fluid pressure.

d. High main steam line radiation.

QUESTION: 026 (1.00)

The 24 VDC power to channel 'A' Source Range Monitor (SRM) preamplifier is interrupted and immediately restored, resulting in channel 'A' SRM output trips and alarms.

SELECT the statement that describes what situation can occur (assume no operator actions).

a. A DOWNSCALE/INOP rod block was generated, however, the block cleared automatically when power was restored.

b. An DOWNSCALE/INOP rod block was generated and must be reset on the 936 Panel before further rod withdrawal can take place.

c. A DOWNSCALE/INOP rod block was not generated, because the HV power supply was not affected.

d. A DOWNSCALE/INOP rod block was generated and must be reset on the 905 Panel before further rod withdrawal can take place.

QUESTION: 027 (1.00)

Given that:

- Intermediate Range Monitor (IRM) Channel 'E' is on Range 2.
- IRM Channels 'B', 'H', 'G', 'D', and 'A' are on Range 3.
- IRM Channels 'C' and 'F' are bypassed.
- Mode Switch is in STARTUP.
- All SRM channels are fully inserted.

WHICH ONE of the following describes the retract permit rod block status if SRM channel 'D' is retracted until a level of 90 counts per minute is achieved?

a. A rod block is in effect due to an IRM channel on Range 2.

b. A rod block is in effect due to SRM Channel D reading less than 100 counts per minute.

c. There is no effect since the IRM's indicate at the point of adding heat.

d. There is no effect since associated IRM's are on Range 3 or bypassed.

QUESTION: 028 (1.00)

WHICH ONE of the following Reactor Core Isolation Cooling (RCIC) trips/isolations can be reset inside the control room when the RCIC Turbine Reset Button is depressed?

a. Turbine overspeed.

b. Low pump suction pressure.

c. High reactor vessel level.

d. Low turbine RPM.

deleted see facility comments B

QUESTION: 029 (1.00)

The automatic depressurization system (ADS) is...

a. part of the safety valves and acts as a backup to the Reactor Core Isolation Cooling (RCIC) System.

b. an Engineered Safety Feature (ESF) and acts as a backup to the Core Spray (CS) System.

c. a pressure relief system for Group 1 isolation and acts as backup to the safety valves.

d. part of the Emergency Core Cooling System (ECCS) and acts as a backup to the High Pressure Coolant Injection (HPCI) System.

QUESTION: 030 (1.00)

During normal power operations, the illuminated green light next to each Safety Relief Valve Control Switch indicates that...

a. the valve closed limit switch is activated.

b. there is a NORMAL low temperature downstream of the valve.

c. there is a NORMAL low noise level sensed by the acoustic monitor.

d. the valve solenoid is in "auto" mode and deenergized.

QUESTION: 031 (1.00)

Plant conditions are as follows:

- single element level control.
- reactor water level of +25 inches.
- master level controller set at +30 inches in AUTOMATIC.
- "A" FRV fully closed in MANUAL.

If the MAN/AUTO signals were NOT matched when the "A" FRV is placed into BALANCE, the "A" FRV will...

a. OPEN in response to the level error.

b. OPEN if feed flow is less than steam flow.

c. REMAIN CLOSED, because the controller is in single element control.

d. REMAIN CLOSED, because automatic level control mode of the "A" FRV is disabled at PNPS.

QUESTION: 032 (1.00)

A loss of offsite power has required the diesel generators to operate at full load to supply emergency power for the last three hours. An annunciator has just come in indicating that a low Day Tank level condition exists for one of the diesel generators. WHICH ONE of the following states how much longer the effected diesel generator can be expected to operate if its fuel transfer pump has not operated since the diesel had started?

a. Until the main fuel oil tank is empty.

b. One hour.

c. Four hours.

d. Eight hours.

QUESTION: 033 (1.00)

During plant operation in the RUN mode, the drywell pressure reaches 2.7 psig.

- Reactor pressure is currently 300 psig.
- When LPCI loop logic is initiated differential pressure across recirc. pumps A and B are greater than 2 psid.
- Loop A jet pump riser pressure is more than one psid greater than loop B jet pump riser pressure two seconds after the LPCI loop logic is initiated.
- Recirculation pumps A and B are tripped.

Based on the above data, WHICH ONE of the following automatic actions occurs?

a. -Injection valve 29B is interlocked closed for 10 minutes
-Recirc pump A discharge valve is closed
-Injection valve 29A is interlocked open for 5 minutes

b. -Injection valve 29A is interlocked closed for 10 minutes
-Recirc pump B discharge valve is closed
-Injection valve 29B is interlocked open for 5 minutes

c. -Injection valve 29A is interlocked closed for 10 minutes
-Recirc pump A discharge valve is closed
-Injection valve 29B is interlocked open for 5 minutes

d. -Injection valve 29B is interlocked closed for 10 minutes
-Recirc pump A discharge valve is closed
-Recirc pump B discharge valve is closed
-Injection valve 29A is interlocked open for 5 minutes

Corrected during exam
B

QUESTION: 034 (1.00)

At 85% reactor power the APRM Calibration section of the OD-3 Printout provided the following results:

APRM	1	2	3	4	5	6
READING	84.7	83.8	85.0	85.0	85.3	84.7
AGAF	1.015	1.206	1.001	0.985	0.970	1.019

WHICH ONE the following identifies ALL the APRMs that require adjustment to read correctly?

a. APRM 4 and APRM 5

b. APRM 1 and APRM 2 and APRM 5

c. APRM 2 and APRM 5

d. APRM 1 and APRM 2 and APRM 3 and APRM 6

QUESTION: 035 (1.00)

WHICH ONE of the following describes the operation of the Reactor Building to TORUS air operated butterfly vacuum breakers. ASSUME the reactor building pressure is at a constant 14.5 psia.

a. Vacuum breaker valves automatically open at a torus pressure of 14.0 psia unless a secondary containment isolation signal is present.

b. Vacuum breaker valves automatically open at a torus pressure of 14.0 psia even if a secondary containment isolation signal is present.

c. Vacuum breaker valves automatically open at a torus pressure of 14.25 psia unless a secondary containment isolation signal is present.

d. Vacuum breaker valves automatically open at a torus pressure of 14.25 psia even if a secondary containment isolation signal is present.

QUESTION: 036 (1.00)

WHICH of the following statements contains ALL the conditions that will cause the hydrogen/oxygen (H2/O2) analyzer system to isolate?

a. Reactor water level +5", drywell pressure 3.1 psig

b. Reactor pressure 95 psig, drywell pressure 2.5 psig

c. Reactor water level -50", O2 concentration less than 4%

d. Reactor water level +8", reactor pressure 75 psig.

QUESTION: 037 (1.00)

While at power in the RUN mode, with the EPR in control, a failure in the EPR setpoint control switch (located on panel C-2) causes the EPR setpoint to steadily lower. WHICH ONE of the following describe the plant response?

a. Reactor pressure will decrease and the MPR will take over control when turbine inlet pressure decreases to the MPR setpoint.

b. Reactor pressure will increase and the MPR will take over control when turbine inlet pressure increases to the MPR setpoint.

c. Reactor pressure will increase to the point which will cause a reactor scram on high reactor pressure.

d. Reactor pressure will decrease to the point in which a Group 1 isolation will occur.

QUESTION: 038 (1.00)

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 the 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.

QUESTION: 039 (1.00)

SELECT the statement that describes HOW the Core Spray inboard and outboard injection valves are interlocked.

a. Prevent manually opening the outboard valve whenever reactor pressure is greater than 400 psig.

b. Prevent manually opening the inboard valve whenever reactor pressure is greater than 400 psig.

c. Prevent manually opening the outboard valve whenever the inboard valve is open. WHENEVER REACTOR PRESSURE is greater than 400 psig

d Prevent manually opening the inboard valve whenever the outboard valve is open. AT ANY REACTOR PRESSURE

Corrected during exam
B

QUESTION: 040 (1.00)

All of the following are conditions that will result in a "Core Spray Break Detection" Annunciator when the reactor is at rated power EXCEPT:

a. A break occurs in the injection line between the vessel and the shroud.

b. The above core plate tap to the differential pressure transmitter breaks at the d/p transmitter.

c. The differential pressure transmitter diaphragm develops a hole which equalizes pressure across the detector.

d. A break occurs in the injection line between the vessel and the injection check valve (9 A/B).

QUESTION: 041 (1.00)

WHICH ONE of the following lists in sequence the components in the control rod drive system that water will pass through when the control rods are NOT IN MOTION?

a. Condensate storage tank --- Y strainer --- restricting orifice and its bypass valve --- condensate storage tank.

b. Condensate demineralizers --- CRD pump --- flow control valve --- drive water pressure control valve --- cooling water pressure control valve --- CRDM --- reactor vessel.

c. Condensate storage tank--- drive water filter --- restricting orifice --- drive water pressure control valve --- CRDM --- reactor vessel.

d. Condensate demineralizers --- CRD pumps --- flow control valve --- drive water pressure control valve --- CRDM --- directional control valve 121 --- exhaust header.

QUESTION: 042 (1.00)

WHICH ONE of the following completes the statement below for the Augmented Off Gas System?

Radiation Monitors at the discharge of the SJAEs provides _____(1)_____. The main steam radiation monitoring trips the _____(2)_____ on main steam line high radiation levels.

a. (1) an isolation signal for the stack isolation valve AO-3751; (2) mechanical vacuum pump seal water pump

b. (1) mechanical vacuum pump seal water pump; (2) an isolation signal for the stack isolation valve AO-3751

c. (1) main condenser vapor valves including AO-3703 and AO-3704; (2) an isolation signal for the stack isolation valve AO-3751 and the stack drain valve, AO-3750

d. (1) an isolation signal for the stack isolation valve AO-3751 and the stack drain valve, AO-3750; (2) main condenser vapor valves including AO-3703 and AO-3704

QUESTION: 043 (1.00)

With the RCIC turbine operating in AUTO, the flow transmitter fails such that the flow feedback signal is LOW. SELECT the statement that describes the speed response of the RCIC turbine.

a. Decrease until speed drops to zero.

b. Decrease to its minimum speed setting of 2200 RPM.

c. Increase to its maximum speed setting of 3600 RPM.

d. Increase to the point where an overspeed trip occurs.

QUESTION: 044 (1.00)

The Reactor Recirculation flow control system limits recirc. pump speed to 20% until feedwater flow is 20% in order to:

a. Stay out of the instability region.

b. Ensure adequate net positive suction head.

c. Limit core plate d/p when reactor coolant is more dense.

d. Limit thermal stress on the reactor vessel.

QUESTION: 045 (1.00)

WHICH ONE of the following describes the MINIMUM parameter(s), for which, the Rod Worth Minimizer System LPAP is BYPASSED.

a. Steam flow OR feed flow greater than 35%.

b. Steam flow greater than 20% for at least 5 seconds.

c. Steam flow greater than 35%.

d. Steam flow AND feed flow greater than 20% for at least 5 seconds.

QUESTION: 046 (1.00)

The reason for maintaining recirculation pump speed between within 10% of each other when reactor power is greater than 85% is to prevent...

a. power instability.

b. cavitation of recirculation purps and jet pumps.

c. temperature stratification in the vessel.

d. an error in the LPCI loop selection logic.

QUESTION: 047 (1.00)

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.

QUESTION: 048 (1.00)

Concerning the residual heat removal system (RHRS), during the shutdown cooling mode, protective interlocks close suction valves MO-1001-47 and MO-1001-50 and assures that they remain closed. WHICH ONE of the following states the reason for the protective interlocks?

a. Protects RHRS low pressure piping from high reactor pressures.

b. Protects vessel components from severe cool down rates.

c. Protect the RHR pumps from cavitation.

d. Protects against thermal stratification developing in the core.

QUESTION: 049 (1.00)

WHICH ONE of the following states the automatic rod block that occurs, if power is lost to the Rod Position Information System (RPIS).

a. select block.

b. withdrawal block.

c. insert block.

d. notch override block.

QUESTION: 050 (1.00)

WHICH ONE of the following will allow the Rod Block Monitor (RBM) to remain operable?

a. Function Switch in "Not in Operate".

b. Only sixty percent of the assigned inputs are operable.

c. More than one control rod selected.

d. Failure to null.

QUESTION: 051 (1.00)

The Main Generator is on line in Auto Voltage Control. The transfer voltmeter is maintained nulled to allow for a smooth transfer to manual should the voltage regulator fail. WHICH ONE of the following is used to maintain the meter nulled?

a. Voltage regulator transfer switch.

b. Manual voltage adjuster control switch.

c. Exciter field control switch.

d. Auto voltage adjuster control switch.

QUESTION: 052 (1.00)

The process that is used in the charcoal beds to reduce the off-gas radioactive release to the environment is by removing...

a. hydrogen gas isotopes using catalytic recombination and condensation.

b. radioactive particulates using high efficiency filtration.

c. noble gas isotopes using adsorption and decay.

d. nitrogen gas isotopes using holdup and decay.

QUESTION: 053 (1.00)

WHICH ONE of the following describes your action once you have discovered two rods in a nine rod array experience drifting during normal power operations?

a. Attempt to move the affected rods one notch in either direction to determine the condition of the drive.

b. Place the Reactor Mode Switch in Shutdown.

c. Increase drive water pressure to stabilize the affected rods, then contact a Nuclear Engineer.

d. Declare the affected rods inoperable and initiate a Failure and Malfunction Report.

QUESTION: 054 (1.00)

The reactor is operating at 100% power with the following annunciator in alarm:

- 904R H3 CORE SPRAY PUMP A DISCH HEADER LOW PRESS

SELECT the statement that describes the meaning of this alarm with respect to the core spray system.

a. The alarm is a normal alarm for the core spray system in a standby condition.

b. The discharge piping is not full and water hammer could occur upon a pump start.

c. The alarm indicates that there is leakage past the injection check valve (1400-9A) to the reactor.

d. The inboard and outboard discharge valves are both in the open position.

QUESTION: 055 (1.00)

A LOCA condition has developed causing a reactor scram. The MSIVs have closed and steam is being rejected to the torus. The LPCI injection signal has been bypassed by placing the Containment Spray Control Switch in "Manual" position to allow for suppression pool cooling with RHR loop B. Approximately 3 minutes after being in the suppression pool cooling mode torus block valve MO-34B and torus cooling valve 36B closed. WHICH ONE of the following describes the reason for these valves to close?

a. Drywell pressure decreased from 2.6 psig to .6 psig and reactor vessel level is at -55" on the wide range instruments.

b. The B loop keylock "Containment Spray Control Switch" was placed to the "Manual Override" position.

c. Reactor vessel level went to -180" on the wide range instruments and drywell pressure is at 2.5 psig and increasing.

d. 10 minute timer has timed out, reactor vessel level is -50" on the wide range instruments and pressure is less than 400 psig.

QUESTION: 056 (1.00)

Given the conditions below:

- LPCI injection signal is present
- The "Containment Spray Valve Control Switch" is placed in the "Manual" position.

WHICH ONE of the following would prevent you from opening the containment spray control valves (MO-23s and MO-26s) with their individual control switches?

a. .9 psig in the drywell.

b. Reactor vessel level -35".

c. 2.7 psig in the drywell.

d. Reactor vessel level -58".

QUESTION: 057 (1.00)

WHICH ONE of the following would explain why both Recirculation MG sets tripped and the only annunciator in alarm was "Loss Of DC Supply".

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.

QUESTION: 058 (1.00)

WHICH ONE of the following explains the reason for NOT operating the Reactor Water Cleanup (RWCU) System with both pumps at flow rates less than 100 gpm?

a. Pump cavitation may occur with two RWCU pumps operating.

b. Non-Regenerative Heat Exchanger outlet temperature will exceed 130 degrees F.

c. To keep the filter demineralizer resin in place.

d. System may isolate on low flow.

QUESTION: 059 (1.00)

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.

QUESTION: 060 (1.00)

WHICH ONE of the following describes automatic actions that results from the actuation of the Turbine Lockout (286-2) relay?

a. ACB 102 trips, ACB 103 trips and the stator cooling system will shutdown.

b. Main Generator field breaker trips, ACB-104 trips and the power supply to the six 4160 VAC busses will auto swap from the Aux. Transformer to the S/U Transformer.

c. Main Turbine trips, ACB-103 Trips and the power supply to the six 4160 VAC busses will auto swap from the Aux. Transformer to the S/U Transformer.

d. ACB 104 and 105 trip, the stator cooling system trips and the Main Generator field breaker trips.

QUESTION: 061 (1.00)

During normal full power operations, WHICH ONE of the following will cause an automatic runback of both recirculation pumps?

a. Loss of one condensate pump.

b. Loss of bus A-4.

c. Reactor Pressure greater than 1175.

d. Reactor water level -50"

QUESTION: 062 (1.00)

WHICH ONE of the following contains automatic actions that can ONLY be associated with a Secondary Containment System isolation?

a. Reactor building supply and exhaust fans trip, Standby Gas Treatment System auto-starts, all reactor building exhaust flow is routed to the Standby Gas Treatment System.

b. Standby Gas Treatment System auto-starts, all reactor building exhaust flow is routed to the Standby Gas Treatment System, Control room supply and exhaust fans secure.

c. All reactor building exhaust flow is routed to the Standby Gas Treatment System, AOG recombiner room HVAC system isolates, reactor building supply and exhaust fans trip.

d. Control room supply and exhaust fans secure, reactor building supply and exhaust fans trip, Standby Gas Treatment System auto-starts.

QUESTION: 063 (1.00)

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

QUESTION: 064 (1.00)

A Transverse Incore Probe (TIP) becomes mechanically bound inside the RPV. Subsequently, a valid Group 2 Isolation condition occurs. WHICH ONE of the following describes the actions necessary to isolate the containment in this situation?

a. The Shear Valve must be shut manually.

b. The Shear Valve will automatically close.

c. The Ball Valve will automatically close.

d. The Ball and the Shear Valve will receive automatic isolation signals.

QUESTION: 065 (1.00)

WHICH ONE of the following describes the response of the Traversing Incore Probe (TIP) to a reactor scram in which RPV level decreases to -13 inches while the detector is in the core? ASSUME the detector is being operated in the manual mode at the TIP control panel.

a. The TIP detector is automatically withdrawn from the core and when the detector clears the ball valve, the ball valve will automatically close.

b. The TIP detector is automatically withdrawn from the core and when clear of the ball valve, a permissive is provided to allow manually closure of the ball valve.

c. The TIP detector will remain in the core and the shear valve will automatically actuate.

d. The TIP detector remains in the manual mode and can be withdrawn as part of the manual operation.

QUESTION: 066 (1.00)

During full power operations the following annunciators go into an alarm condition:

	Panel	Window
1. CONDENSER HIGH PRESS	C1L	E5
2. CONDENSER LOW VACUUM	C2L	D1

WHICH ONE of the follow describes the necessary immediate actions?

a. Begin driving perimeter control rods in to reduce reactor power as quickly as possible.

b. Select the Cram Array control rods and begin driving them in to reduce reactor power as quickly as possible.

c. Reduce core flow to not less than 31.5 mlb/hr to stop the vacuum decrease.

d. Runback the recirculation pumps to minimum speed.

QUESTION: 067 (1.00)

PNPS 2.1.6, "Reactor Scram," states that after the RPS logic is reset the RO should:

Place the Air Dump System Test Switch to the "ISOLATE" position.

SELECT the statement that describes WHY this step is necessary to reset the Scram.

a. The "ISOLATE" position isolates and depressurizes the SPVAH which allows the scram valves to shut.

b. In "ISOLATE," air is supplied to shut the backup scram valves which then allows the SPVAH to repressurize.

c. The "ISOLATE" position supplies air to shut the scram valves which then allows the SPVAH to repressurize the SPVAH dump valve.

d. In "ISOLATE", the SPVAH dump valve air supply point shifts allowing the valve to reset and repressurize shutting the scram valves.

QUESTION: 068 (1.00)

WHICH ONE of the following conditions satisfies the RHR logic for the Shutdown Cooling operations?

a. MO-47 is full open, MO-50 is full open, and reactor level is +25".

b. MO-47 is full open, MO-50 closed, and reactor pressure is 90 psig.

c. MO-47 is open, reactor pressure is 90 psig, and reactor level is +7".

d. MO-50 is open, reactor pressure is 110 psig and reactor level is +30".

QUESTION: 069 (1.00)

WHICH ONE of the following completes the statement given below. Assume full power normal operations.

With three feedpumps operating the loss of one feedwater flow input signal corresponds to a _____(1)____ and the resultant flow error demands _____(2)_____ feedwater flow.

a. (1) 33% feedwater signal loss
(2) less

b. (1) 33% feedwater signal loss
(2) more

c. (1) 50% feedwater signal loss
(2) less

d. (1) 50% feedwater signal loss
(2) more

QUESTION: 070 (1.00)

WHICH ONE of the following completes the statement given below. Assume full power normal operations.

The feedwater level control (FWLC) system has lost one of its steam flow input signals. This will cause steam flow to indicate 75% and the FRVs will _____(1)_____ and the reactor vessel level will_____(2)_____.

a. (1) close
   (2) decrease and the reactor will scram

b. (1) go full open
   (2) increase and trip the main turbine

c. (1) start closing
   (2) decrease but will not scram

d. (1) start opening
   (2) increase but not trip the main turbine

QUESTION: 071 (1.00)

EOP-03, the Primary Containment Pressure Control leg, does NOT allow the operator to start drywell sprays if the torus water level is greater than 180". WHICH ONE of the following describes the reason for this restriction on using drywell spray?

a. This prevents drywell chugging.

b. This prevents excessive dynamic loading on the drywell vent downcomers.

c. This prevents proper operation of the torus/drywell vacuum breaker.

d. This ensures adequate suppression chamber air space volume to receive drywell drainage.

QUESTION: 072 (1.00)

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-3 (Primary Containment Control).

d. EOP-01, and EOP-03.

QUESTION: 073 (1.00)

With reactor power at 50%, the "A" Reactor Recirculation (RR) Pump begins to steadily increase speed at about 1% per second. Depressing the Scoop Tube Lock Reset has NOT stopped the transient. Reactor power and recirculation flow continue to increase. WHICH ONE of the following describes the next IMMEDIATE OPERATOR ACTION that should be taken to terminate this transient?

a. Scram the reactor.

b. Trip both RR Pumps.

c. Trip RR Pump "A".

d. Lock the Scoop Tube locally.

QUESTION: 074 (1.00)

The power to flow map shows an instability region above the 80% rod line and has identified them as regions A, B and C. WHICH ONE of the following responses may result from operating in these regions?

a. The APRMs may fail to generate a reactor trip signal when required.

b. Flow oscillations may result in a loss of net positive suction head to the Reactor Recirculation Pumps.

c. Localized and core wide power oscillations may require a manual reactor scram.

d. LPRM cycles from high alarm to low alarm may cause an increased instrument failure rate.

QUESTION: 075 (1.00)

In accordance with PNPS procedure No. 5.3.23, "Alternate Rod Insertion," following an incomplete scram, WHICH ONE of the following methods for inserting control rods requires the scram to be reset?

a. Insert a manual Scram from panel 905.

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

c. Maxirizing drive water pressure for control rod insertion.

d. Venting the scram air header.

QUESTION: 076 (1.00)

WHICH ONE of the following completes the statement below?

The Anticipated Transient Without a Scram (ATWS) system trips with increasing reactor pressure at ____(1)____. One resulting automatic action of ATWS is to rapidly increase voiding in the core by tripping open the motor generator ____(2)____ breaker for the recirculation pumps.

a. (1) 1,175 psig, (2) drive.

b. (1) 1,175 psig, (2) field/drive.

c. (1) 1,075 psig, (2) drive.

d. (1) 1,075 psig, (2) field/drive.

QUESTION: 077 (1.00)

Given that:

- A scram has occurred due to low vessel level.
- Reactor power remains above 10% after the scram.
- Reactor vessel level is decreasing.

WHICH ONE of the following completes the statement below?

Alternate Rod Insertion (ARI) circuit trip occurs at a vessel level of ____(1)____ inches and ____(2)____ the ARI valve solenoids to vent the scram valve pilot air header.

a. (1) +9, (2) energizes.

b. (1) +9, (2) deenergizes.

c. (1) -49, (2) energizes.

d. (1) -49, (2) deenergizes.

QUESTION: 078 (1.00)

The plant is operating at 95% power. A reactivity transient occurs which causes:

- APRM indication to decrease and return to 100%
- No change to total core flow
- Generator MW to decrease
- RPV level swells then lowers to below the original level

WHICH ONE of the following is the cause of the reactivity transient?

a. RCIC initiation

b. Reactor recirculation pump A speed increase

c. SRV stuck open

d. Feedwater heater isolation

QUESTION: 079 (1.00)

WHICH ONE of the following contains three (3) conditions that would require entry into EOP-03, "Primary Containment Control"?

a. Bulk drywell temperature 140 deg. F., drywell pressure 2.5 psig, torus water level 132 in. Wide Range.

b. Average torus water temperature is 81 deg. F, Bulk Drywell temperature is 151 deg. F, primary containment H2 concentrations are 3%.

c. Drywell pressure is 2.6 psig, reactor water level is +8 in. on the narrow range, and RPV pressure is 1090 psig.

d. Primary H2 concentrations are 5%, bulk drywell temperature is 151, drywell pressure is 2.8.

QUESTION: 080 (1.00)

At full power operations an incident occurs requiring a control room evacuation. No time was available to reduce reactor power. You have been directed to trip all operating reactor feed pumps. WHICH ONE of the following states the location(s) where you would perform this action?

a. 23' RPS MG room and the 37' switch gear room.

b. 3' Aux Bay and the 23' reactor bldg.

c. 51' turbine bldg.

d. 37' switch gear room and the 23' switch gear room.

QUESTION: 081 (1.00)

An event has occurred that requires the control room to be evacuated and you have just directed the STA to monitor reactor water level. WHICH ONE of the following locations would the STA go to in order to monitor reactor water level?

a. Inst. rack 2258 at 2'9" in the RCIC quadrant.

b. -17'6" near the reactor sump.

c. 51' turbine bldg.

d. 51' reactor bldg.

QUESTION: 082 (1.00)

WHICH ONE of the following is NOT an electrical load on the 125 VDC System?

a. Indicating lights for equipment on 4160 V busses.

b. Automatic Depressurization System solenoid operated valves.

c. Main Turbine control power.

d. Vital Services MG Set.

QUESTION: 083 (1.00)

Given that:

-the Unit is in single loop operation, due to a trip of a recirculation pump,

-the load line is 87%,

-the core flow is 30 Mlb/hr,

WHICH ONE of the following describes the appropriate operator action when LPRM downscale alarms start to cycle approximately every 2 to 3 seconds?

a. restart the tripped recirculation pump.

b. adjust recirculation flow on running loop.

c. scram the reactor.

d. bypass the Rod Worth Minimizer and insert each control rod in reverse sequence to Position 00.

QUESTION: 084 (1.00)

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 23" Hg vacuum which will cause a reactor scram.

b. The turbine will trip at 23" Hg vacuum resulting in generator load reject and actuation of the select rod insert.

c. The turbine will trip before the reactor scrams at 23" Hg vacuum.

d. The turbine will trip after the reactor scrams at 23" Hg vacuum.

QUESTION: 085 (1.00)

The reactor was manually scrammed due to a loss of TBCCW. WHICH ONE of the following states your immediate action(s) once you have determined TBCCW CAN NOT be restored?

a. Trip all the feedwater pumps.

b. Trip all condensate pumps and VERIFY all the feedpumps have tripped.

c. Control reactor level in Single Element Control with one feedwater pump.

d. Control reactor level with the Start-up Control valve with one feedwater pump.

QUESTION: 086 (1.00)

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 Low.	C2 Right	A6
- Service Air Header Isolation.	C2 Right	A5
- Standby Compressor Running	C2 Right	C6

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.

QUESTION: 087 (1.00)

After months of full power operation the reactor has just scrammed and the plant parameters are as follows with the mode switch in "RUN":

- Reactor water level .....+52"
- Reactor pressure .....790 psig
- Drywell pressure .....2.2 psig
- HPCI equipment area temp. .....150 deg. F
- RCIC turbine compartment temp. ...150 deg. F
- RWCU area temp. .....150 deg. F
- Torus temp. .....82 deg. F
- Torus water level .....95"
- Drywell temp. .....185 deg. F

WHICH ONE of the following component or system actions should have occurred?

a. Drywell equipment drains close and the HPCI torus suction valves close.

b. The reactor building HVAC system isolates and the RCIC turbine steam inlet valves close.

c. LPCI injection valves interlocked closed and the RWCU system discharge isolation valves close.

d. The recirculation system sample valves closes and the main steam line drains isolate.

QUESTION: 088 (1.00)

During reactor operation, preferred AC power (offsite) is lost to all RBCCW pumps. WHICH of the following describes the effect of the power loss on the RBCCW system?

a. The operating pumps trip and must be manually restarted when offsite or emergency bus power is restored.

b. RBCCW pumps will sequence in each loop when the emergency bus is restored until 60 psig is achieved.

c. All RBCCW pumps will sequence on at 30 second intervals, when either offsite or emergency bus power is provided.

d. The operating RBCCW pumps will lockout and the standby pumps will sequence on at 30 second intervals when emergency bus power is provided.

QUESTION: 089 (1.00)

Following a loss of both CRD pumps, WHICH ONE of the following describes the plant response when the reactor is operating?

a. Control Rod HCUs may suddenly depressurize causing the scram function to become inoperable.

b. The recirculation pump Number 2 seals would increase in pressure.

c. The CRD flow control valve will close to try and maintain the desired flow rate.

d. Control Rod Drive Mechanisms will experience an increase in temperature.

QUESTION: 090 (1.00)

The "A" diesel generator (DG) is being tested. The governor is selected for DROOP and the test switch is in TEST. A loss of coolant accident (LOCA) initiation signal has just come in. WHICH ONE of the following describes the response of the "A" DG?

a. Transfers to isochronous mode; the test switch remains in TEST and the DG continues to run.

b. Transfers to isochronous mode; the test switch transfers to NORMAL and the DG continues to run.

c. Remains in the droop mode; the test switch transfers to NORMAL and the DG continues to run.

d. Remains in the droop mode; the test switch remains in TEST and the DG continues to run.

QUESTION: 091 (1.00)

Procedure 5.2.2 High Winds directs you to reduce power to 130 Mwe when the wind conditions reach velocities of 75 miles per hour or greater. WHICH ONE of the following states the basis for this action?

a. To limit thermal transients from a scram resulting from a failure of the unit auxiliary transformer.

b. To limit the load to the reject capability of the turbine generator system due to pending failure of the 345 KV lines.

c. To limit thermal transients from a scram resulting from a failure of the 345KV power lines.

d. To limit the load to the reject capability of the turbine generator system due to pending failure of the unit auxiliary transformer.

QUESTION: 092 (1.00)

The reactor is shutdown with the residual heat removal (RHR) shutdown cooling (SDC) mode providing core heat removal. The RHR experiences a system isolation. WHICH ONE of the following conditions caused the isolation?

a. Reactor pressure is 105 psig.

b. Reactor water level is +46 inches.

c. Drywell temperature is 137 deg F.

d. Drywell pressure is 2.25 psig.

QUESTION: 093 (1.00)

WHICH ONE of the following is a parameter used by EOP-04, Secondary Containment Control for determining if an entry condition exist?

a. Hydrogen concentrations in the reactor building.

b. Radiation levels in the drywell.

c. Refuel floor area temperature.

d. HPCI turbine area temperature.

QUESTION: 094 (1.00)

Refueling operations are in progress. Technical specifications requires that during a spiral core loading the source range monitors (SRM) must be checked with an external source every 12 hours. WHICH ONE of the following states the MINIMUM criteria necessary for discontinuing the surveillance?

a. The surveillance may be stopped when at least one assembly with a minimum exposure of 800 MWD/ST is in the control cell.

b. The surveillance may be stopped when the SRM count rate is greater than 5 counts per second.

c. The surveillance may be stopped when at least one assembly with a minimum exposure of 1000 MWD/ST is in the control cell.

d. The surveillance may be stopped when the SRM count rate is greater than 3 counts per second.

QUESTION: 095 (1.00)

WHICH ONE of the following describes the effect on the Augmented Off Gas (AOG) System if TBCCW were lost during full power operations?

a. Possible loss of gland seal purge to AOG valves.

b. Loss of gland seal holdup line loop seal.

c. Loss of cooling to the inter and after condensers.

d. Possible increase in the AOG system moisture content.

QUESTION: 096 (1.00)

The plant is at 100% power. WHICH ONE of the follow describes the effects of a total loss of 125 VDC power on the main steam isolation valves?

a. Loss of control and position indicating lights for all MSIVs.

b. Loss of control to the inboard MSIVs.

c. Loss of control to the outboard MSIVs.

d. Loss of MSIV position indicating lights.

QUESTION: 097 (1.00)

The reactor is at full power. WHICH ONE of the following valve(s) are designed to fail open during a complete loss of instrument air?

a. RBCCW head tank make-up valve.

b. Feedwater reg. valves.

c. Main stack isolation valve.

d. Main condenser vapor valves.

QUESTION: 098 (1.00)

WHICH ONE of the following sets of plant parameters contains ONLY designed reactor building isolation trip signals?

a. Reactor building greater than 1/4 inch of water pressure, drywell pressure 2.5 psig, RPV level +9 inches.

b. Reactor building greater than 1/4 inch of water pressure, drywell pressure 2.5 psig, refuel floor radiation level is greater than 16 Mrem/hour.

c. RPV level +9 inches, drywell pressure 2.5 psig, refuel floor radiation level greater than 16 Mrem/hr.

d. RPV level +9 inches, refuel floor radiation level greater than 16 Mrem/hr, reactor building greater than 1/4 inch of water pressure.

QUESTION: 099 (1.00)

Given the following conditions:

- High pressure coolant injection (HPCI) is operating
- The flow test valve is throttled open
- The HPCI flow controller is in MANUAL
- The injection valve is closed
- The minimum flow valve is closed

WHICH ONE of the following states the effect on the pump discharge pressure and pump flow as the reactor pressure decreases from 960 to 150 psig? ASSUME no operator actions are taken.

a. The pressure decreases and the flow decreases.

b. The pressure remains constant and the flow remains constant.

c. The pressure decreases and the flow remains constant.

d. The pressure remains constant and the flow decreases.

QUESTION: 100 (1.00)

The reactor is operating at full power. A Group 1 (MSIV) isolation occurs and no control rods insert due to blockage of the scram discharge volumes. Reactor pressure is observed to have reached 1425 psig. WHICH ONE of the following will trip?

a. Reactor feed pumps

b. Condensate pumps

c. High pressure coolant injection (HPCI)

d. Reactor building closed cooling water pumps

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

ANSWER: 001 (1.00)

a. [+1.0]

REFERENCE:

1. Sys. Ref.: "Fuel Pool Cooling and Filtration System", pg FPC-1.

[2.9/3.2]

233000K306 ..(KA's)

ANSWER: 002 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS: Proc. No. 1.3.34, Rev 33, "Conduct of Operations"; pg 20 of 62.

[3.7/3.7]

294001K101 ..(KA's)

ANSWER: 003 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS: Proc. No. 1.3.34, Rev 33, "Conduct Of Operations", pg 12 of 62.

[3.3/4.2]

294001A109 ..(KA's)

ANSWER: 004 (1.00)

b. [+1.0]

REFERENCE:

1. IG: C-GT-02-02-06,"Emergency Preparedness", pg 552C/15; ELO 1.
[2.9/4.7]

294001A116 ..(KA's)

ANSWER: 005 (1.00)

b. [+1.0]

REFERENCE:

1. C-GT-02-03-02 Rev. 2, pg 675C/33; LO 2.
[2.7/3.7]

294001A103 ..(KA's)

ANSWER: 006 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Tagging Procedure PNPS 1.4.5, rev 34, pg 22 of 54.
[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 007 (1.00)

b. [+1.0]

REFERENCE:

1. C-GT-02-02-06 Rev. 0, pg 552C/16; LO 2.
[2.9/4.7]

294001A116 ..(KA's)

ANSWER: 008 (1.00)

b. [+1.0]

REFERENCE:

1. C-GT-02-03-04 Rev. 0, pg 556C/17; LO 4.

[3.3/3.6]

294001K104 ..(KA's)

ANSWER: 009 (1.00)

b. [+1.0]

REFERENCE:

1. C-GT-02-02-01 Rev. 0, pg 547C/12; LO 5.
[3.3/3.8]

294001K103 ..(KA's)

ANSWER: 010 (1.00)

a. [+1.0]

REFERENCE:

1. C-GT-02-01-03 Rev. 3, pg 53?C/18; LO 6.

[3.2/3.7]

294001K105 ..(KA's)

ANSWER: 011 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.5.2, Rev. 15, "Special Fire Procedure Att. AA", pg 101 of 122

[3.5/3.8]

294001K116 ..(KA's)

ANSWER: 012 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.3.21, Rev. 10, "Bypassing Selected Interlocks", pg 4 of 54.

[3.5/4.2]

294001A112 ..(KA's)

ANSWER: 013 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.148 Rev. 5, "Abnormal Reactor Water Chemistry", pg 2 of 11.

[2.9/3.4]

294001A114 ..(KA's)

ANSWER: 014 (1.00)

c. [+1.0]

REFERENCE:

1. I.G. 0-R0-03-04-02, "EOP Development and Use", pg IG-30

[3.8/4.4]

294001A102 ..(KA's)

ANSWER: 015 (1.00)

b. [+1.0]

REFERENCE:

1. HTFF chapter 9, obj 3, 4, 5

[3.1/3.6]

294001A108 ..(KA's)

ANSWER: 016 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-02, Rx Protection and ATWS Systems, pg IG-6; ELO 6.

[3.5/3.6]

201001K203 ..(KA's)

ANSWER: 017 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-02, Rx Protection and ATWS Systems, pg IG-3 and IG 6; ELO 6 and ELO 11.

[3.5/3.6]

212000K106 ..(KA's)

ANSWER: 018 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System", pg and IG-23; ELO 24f.
2. Sys. Ref.: "Reactor Manual Control", pg RMC-5-5/89.

[3.5/3.5]

201002K402 ..(KA's)

ANSWER: 019 (1.00)

b. [+1.0]

REFERENCE:

1. Sys. Ref.: "Diesel Generators", pg DG-20 and DG-21.

[3.3/3.4]

264000K407 ..(KA's)

ANSWER: 020 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-03, "High Pressure Coolant Injection", pg IG-30-7/89; ELO 18f.
2. Sys. Ref.: "High Pressure Coolant Injection", pg HPCI-12-5/89.

[3.2/3.4]

206000K406 ..(KA's)

ANSWER: 021 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-01, "Non-Nuclear Instrumentation" , pg IG-23-4/89; ELO 10.
2. Sys. Ref.: "Non-Nuclear Instrumentation", pg NBI-3-4/89.

[3.4/3.3]

216000A101 ..(KA's)

ANSWER: 022 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-03, "High Pressure Coolant Injection", pg IG-27-7/89; ELO 8.
2. Sys. Ref.: "High Pressure Coolant Injection", pg HPCI-25-5/89.

[4.2/4.1]

206000K403 ..(KA's)

ANSWER: 023 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-03, "High Pressure Coolant Injection", pg IG-19-7/89 and IG-26-7; ELO 10 and 17.
2. Sys. Ref.: "High Pressure Coolant Injection", pg HPCI-35-5/89.

[3.9/4.0]

206000K402 ..(KA's)

ANSWER: 024 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-06, "Standby Liquid Control System", pg IG-6-6/89.

[4.1/4.1]

211000G004 ..(KA's)

ANSWER: 025 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-02, "Reactor Protection System and ATWS System", table 2 item 14; ELO 14.

[3.9/4.1]

212000K412 ..(KA's)

ANSWER: 026 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-01, "Neutron Monitoring Systems", pg IG-4 and figure 10 Rev 1; ELO 8 and 11.

[3.1/3.2]

215004K602 ..(KA's)

ANSWER: 027 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-01, "Neutron Monitoring Systems", pg IG-4; ELO 10.

[3.4/3.4]

215004K102 ..(KA's)

ANSWER: 028 (1.00)

b. [+1.0]

deleted see facility Comments

REFERENCE:

1. IG: 0-RO-02-09-04, "Reactor Core Isolation Cooling System", pg IG-7-7/89; ELO 12.

   [3.8/3.7]

   217000G007 ..(KA's)

ANSWER: 029 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-05, "Automatic Depressurization System", pg IG-1-7/89; ELO 1.

   [4.0/4.1]

   218000G004 ..(KA's)

ANSWER: 030 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-05, "Automatic Depressurization System", pg IG-15-7/90; ELO 7, 19 and 22.

   [3.6/3.6]

   239002A407 ..(KA's)

ANSWER: 031 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-02, "Condensate and Feedwater System", pg IG-26; ELO 68.

   [3.1/3.1]

259002K501 ..(KA's)

ANSWER: 032 (1.00)

b. [+1.0]

REFERENCE:

1. Sys. Ref.: "Diesel Generators", pg DGS-18. ELO-07

   [3.6/3.6]

264000K602 ..(KA's)

ANSWER: 033 (1.00)

a. [+1.0]

REFERENCE:

1. Sys. Ref.: "Residual Heat Removal Syste ", pg RHR-31 and figure "LPCI Loop Selection Logic" TP-20.
   [4.0/4.0]

203000K411 ..(KA's)

ANSWER: 034 (1.00)

d. [+1.0]

REFERENCE:

1. Sys. Ref.: "Average Range Power Monitor", pg APRM-14-5/89.
2. PNPS Proc. No. 2.1.15 Rev 86 "Daily Log Test #22".

[3.0/3.4]

215005A107 ..(KA's)

ANSWER: 035 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-01, "Primary Containment System", pg IG-14-9/89; ELO 16.

[3.1/3.3]

223001K501 . (KA's)

ANSWER: 036 (1.00)

a. [+1.0]

REFERENCE

1. IG: 0-RO-02-08-01, "Pilary Containment System", pg IG-21-9/89; ELO 33.

[3.5/3.5]

223002A302 ..(KA's)

ANSWER: 037 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-05-01, "Main Turbine System", pg IG-16-5/89; ELO 72.

[4.2/4.3]

241000K302 ..(KA's)

ANSWER: 038 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-03, "Standby Gas Treatment System". ELO 7.
2. Station Question 68 57980/42

[2.7/2.7]

261000A409 ..(KA's)

ANSWER: 039 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-02, "Core Spray System", ELO 8.
2. Sys. Ref.: "Core Spray System",

[3.2/3.4]

209001K401 ..(KA's)

ANSWER: 040 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-02, "Core Spray System", ELO 12.
2. Sys. Ref.: "Core Spray System",

[3.2/3.4]

209001K401 ..(KA's)

ANSWER: 041 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System", pg IG-14 and figure 1 Rev. 1; ELC 15.

[3.4/3.4]

201001K108 ..(KA's)

ANSWER: 042 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-03, "Main Condenser Vacuum and Augmented Off Gas System", pg IG-25-5/89; ELO 9i.

[3.2/3.5]

272000K102 ..(KA's)

ANSWER: 043 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-04, "Reactor Core Isolation Cooling System", pg IG-4-7/89; ELO 8.
2. Sys. Ref.: "Reactor Core Isolation Cooling System", pg RCIC-20 and figure 15.

[3.7/3.7]

217000A105 ..(KA's)

ANSWER: 044 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System", pg IG-10; ELO 29d.

[3.1/3.1]

202002K406 ..(KA's)

ANSWER: 045 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System", pg IG-35; ELO 31.

[3.4/3.5]

201006K404 ..(KA's)

ANSWER: 046 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System", pg IG-29; ELO 19c.

[3.7/3.9]

202001K306 ..(KA's)

ANSWER: 047 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-05, "Reactor Water Cleanup System", pg IG-3-7; ELO 8.

[3.5/3.6]

204000K404 ..(KA's)

ANSWER: 048 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-01, "LPCI and RHR System", pg IG-7; ELO 14.
2. Sys. Ref.: "Primary Containment Isolation System", pg PCIS-16-6/89.

[3.7/3.8]

205000K402 ..(KA's)

ANSWER: 049 (1.00)

a. [.0]

REFERENCE:

1. IG: 0-RO-02-06-04, "Rod Position And Information System", pg IG-4-6/89; ELO 11.

[3.2/3.2]

214000K104 ..(KA's)

ANSWER: 050 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System", pg TP-23-8/89.
2. Sys. K[illegible] "Rod Block Monitor System", pg RBM-9.

[3.4/3.5]

215002K401 ..(KA's)

ANSWER: 051 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-01-03, "Main Generator", pg IG-19-4/89; ELO 6 and 7.
2. Sys. Ref.: "Main Generator", pg MG-20 and MG-22.

[3.1/2.9]

245000A402 ..(KA's)

ANSWER: 052 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-03, "Main Condenser Vacuum and Augmented Off Gas System", pg IG-14-5/89; ELO 2.

[3.1/3.6]

271000K111 ..(KA's)

ANSWER: 053 (1.00)

b. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.11,"Control Rod Drive Malfunctions"; pg 2 of 14.

[3.4/3.7]

201003A203 ..(KA's)

ANSWER: 054 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-02, "Core Spray Syster", pg IG-5-8/89; ELO 07.
2. ARP 904R-H3, rev 4
   [3.0/3.2]

209001K402 ..(KA's)

ANSWER: 055 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-01, "LPCI and RHR System", pg IG-8 and IG-10; ELO 14.
2. Sys. Ref.: "Residual Heat Removal System", RHR-13.

   [3.3/3.3]

219000A301 ..(KA's)

ANSWER: 056 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-01, "LPCI and RHR System", pg IG-10; ELO 14.
2. Sys. Ref.: "Residual Heat Removal System", RHR-33.

   [3.1/3.4]

226001A105 ..(KA's)

ANSWER: 057 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-03-01, "DC Electrical Distribution System", pg IG-12-4/89; ELO 7 and 8.

   [3.1/3.4]

   263000K201 ..(KA's)

ANSWER: 058 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-05, "Reactor Water Cleanup System", pg IG-8-7/90; ELO 12.

   [3.2/3.2]

   204000G010 ..(KA's)

ANSWER: 059 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-05, "Plant Ventilation Systems", pg IG-9-7/90; ELO 7.

   [2.9/3.0]

   290003K107 ..(KA's)

ANSWER: 060 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-01-02, "AC Electrical Distribution System", pg IG-6 and IG-7; ELO 5.

[3.1/3.2]

262001A301 ..(KA's)

ANSWER: 061 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-02, "Condensate and Feedwater System", pg IG-37; ELO 15.
2. IG: 0-RO-02-06-02, "Recirculation System", pg IG-32; ELO 34b.

[3.6/3.7]

256000K304 ..(KA's)

ANSWER: 062 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-05, "Plant Ventilation Systems", pg IG-11-7/90; ELO 5 and ELO 6.

[3.9/4.0]

290001A301 ..(KA's)

ANSWER: 063 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-05, "Plan Ventilation Systems", pg IG-4-7/90 and IG-13-7/90; ELO 12

[3.8/3.8]

288000A301 ..(KA's)

ANSWER: 064 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-01, "Neutron Monitoring Systems", pg IG-17; ELO 44

[3.4/3.7]

215001A207 ..(KA's)

ANSWER: 065 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-01, "Neutron Monitoring Systems", pg IG-18; ELO 42

[3.3/3.4]

215001K105 ..(KA's)

ANSWER: 066 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. 2.4.36, Rev. 12, "Decreasing Condenser Vacuum"; pg 2 of 6.

[3.6/3.6]

295003G005 ..(KA's)

ANSWER: 067 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. 2.1.6, Rev. 31, "Reactor Scram"; pg 5 of 12.
2. 0-RO-02-07-02, pg IG-04 LO 10 (Facility question #64. 8/31/91)

[1.1/4.2]

295006G010 ..(KA's)

ANSWER: 068 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-01, "Primary Containment Systems", pg IG-24-9/89.
2. IG: 0-RO-02-09-01, "LPCI and RHR System", ELO 14.

[2.9/3.1]

295007K205 ..(KA's)

ANSWER: 069 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-02, "Condensate and Feedwater System", pg IG-41; ELO 83.

[3.4/3.4]

295008A202 ..(KA's)

ANSWER: 070 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-02, "Condensate and Feedwater System", pg IG-41; ELO 81.

[3.9/3.9]

295009K202 ..(KA's)

ANSWER: 071 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-05, "Primary Containment Control", pg IG-29; ELO 11.

[3.3/3.5]

295010K202 ..(KA's)

ANSWER: 072 (1.00)

d. [+1.0]

REFERENCE:

1. Instructor Guides for EOP-01, EOP-02 and EOP-03; entry conditions.

   [4.2/4.5]

   295010G011 ..(KA's)

ANSWER: 073 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.20, Rev. 11, "Immediate Operator Actions", pg 2 of 5.

   [3.6/3.8]

   295014A102 ..(KA's)

ANSWER: 074 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System", pg IG-22; ELO 18 and ELO 23.
2. PNPS Proc. No. 2.1.1, Rev. 68, "Startup from Shutdown", pg 10 of 94.

   [3.6/3.7]

   295014K211 ..(KA's)

ANSWER: 075 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.3.23, Rev. 8, "Alternate Rod Insertion", pg 6,7,8 and 9 of 15.

[3.8/3.9]

295015A101 ..(KA's)

ANSWER: 076 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System", pg IG-25; ELO 19f and ELO 35.
2. IG: 0-RO-02-07-02, "RPS and ATWS System", pg IG-14; ELO 30.

[4.1/4.2]

295037K210 ..(KA's)

ANSWER: 077 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-02, "RPS and ATWS System", pg IG-15 and IG-26; ELO 30.

[4.1/4.2]

295037K203 ..(KA's)

ANSWER: 078 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-04, "Reactor Core Isolation Cooling System"; ELO 14.
   [4.0/4.3]

   295014A203 ..(KA's)

ANSWER: 079 (1.00)

d. [+1.0]

REFERENCE:

1. IG: ^-RO-03-04-05, "EOP-03 Primary Containment Control"; ELO 2.
   [4.1/4.4]

   295013G011 ..(KA's)

ANSWER: 080 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.143, Rev. 10, "Shutdown from Outside the Control Room", pg 5 of 81.
   [4.0/4.1]

   295016K202 ..(KA's)

ANSWER: 081 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.143, Rev. 10, "Shutdown from Outside the Control Room", pg 5 of 81.

[4.0/4.1]

295016A106 ..(KA's)

ANSWER: 082 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-03-01-01, "DC Electrical Distribution System", pg IG-11-4/89 through IG-13-4/89; ELO 7.

[3.5/3.9]

295004A202 ..(KA's)

ANSWER: 083 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System"; ELO 17.
2. Sys. Ref.: "Reactor Recirculation System", pg RR-34.
3. PNPS Proc. No. 2.4.17, Rev. 13, "Recirculation Pump(s) Trip"; pg 4 of 8.

[3.4/3.6]

295001K304 ..(KA's)

ANSWER: 084 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-05-01, "Main Turbine System", pg IG-33-5/89; ELO 29.
2. IG: 0-RO-02-07-02, "RPS and ATWS System", pg IG-13; ELO 14.

[3.6/3.8]

295002K103 ..(KA's)

ANSWER: 085 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.41, Rev. 14, "Loss of TBCCW", pg 3 of 7.

[3.4/3.3]

295018G010 ..(KA's)

ANSWER: 086 (1.00)

b. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.3.8, Rev. 15, "Lo. of Instrument Air", pg 2 of 9
2. IG: 0-RO-02-02-04, "Instrument and High Pressure Air"; ELO 7.
[3.5/3.6]

295019A201 ..(KA's)

ANSWER: 087 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-01, "Primary Containment System", pg IG-18-9/89 through IG-33-89/89; ELO 34.

[3.7/3.6]

295020A101 ..(KA's)

ANSWER: 088 (1.00)

b. [+1.0]

REFERENCE:

1. System Reference Text, Book 3 RB3-4/89

[3.3/3.5]

295012K101 ..(KA's)

ANSWER: 089 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System"; ELO 15 and 9.
2. PNPS Proc. No. 2.4.4, Rev. 9, "Loss of CRD Pumps", pg 4 of 5.

[3.1/3.1]

295022K202 ..(KA's)

ANSWER: 090 (1.00)

a. [+1.0]

REFERENCE:

1 PNPS: Proc. 2.2.8 Standby AC Pwr. Sys., Rev. 24, pg 13 and 14.
2. IG: 0-RO-02-09-06, "Diesel Generator System", pg IG-15-9/89; ELO 4 and ELO 20.

[3.8/4.0]

295003G006 ..(KA's)

ANSWER: 091 (1.00)

b. [+1.0]

REFERENCE:

1. PNPS: Proc. 5.2.2 High Winds, Rev. 14, p. 2 and 4.
2. Question came from the previous PNPS licensing written exam.

[3.2/3.6]

295003G007 ..(KA's)

ANSWER: 092 (1.00)

a. [+1.0]

REFERENCE:

1. IG: RO-02-08-01,"Primary Containment System", pg; IG-28-9/89; ELO-33.

[3.2/3.3]

295021A206 ..(KA's)

ANSWER: 093 (1.00)

d. [+1.0]

REFERENCE:

1. IG: RO-03-04-06,"EOP-04 Secondary Containment Control", pg IG-3, Table H; ELO-04.

   [4.1/4.2]

   295032G011 ..(KA's)

ANSWER: 094 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS: TS 3.10 Core Monitoring Bases, Rev 152. p.2C4A.
2. Proc. No. 4.3 "Fuel Handling", Rev. 52, pg. 5 and 23 of 36. [2.9/3.6]

   295023G007 ..(KA's)

ANSWER: 095 (1.00)

d. [+1.0]

REFERENCE:

1. IG: RO-02-04-03,"Main Condenser Vacuum and Augmented Off Gas System", pg IG-24-5/89; ELO 9b.

   [3.4/3.6]

   295018K202 ..(KA's)

ANSWER: 096 (1.00)

d. [+1.0]

REFERENCE:

1. IG: RO 02-04-01,"Main Steam System", pg IG-18-7/90; ELO 21.

[3.2/3.3]

295004A204 ..(KA's)

ANSWER: 097 (1.00)

a. [+1.0]

REFERENCE:

1. IG: RO-02-02-04, "Instrume.. and High Pressure Air"; ELO 7.
2. IG: RO-02-04-02, ' ondensate and Feedwater System"; IG-43.

[3.6/3.6]

295020A205 ..(KA's)

ANSWER: 098 (1.00)

c. [+1.0]

REFERENCE:

1. IG: RO-02-08-05, "Plant Ventilation Systems", pg IG-7-7/90; ELO 4.

[3.9/3.9]

295034K204 ..(KA's)

ANSWER: 099 (1.00)

~~a~~. b [.0]

changed as per facility comment B

REFERENCE:

1. IG: RO-02-09-03, "High Pressure Coolant Injection", pg IG- 6-7/89 through IG-10-7/89, ELO 3, 5 and 16.

   [3.5/3.7]

   2 300AA104 ..(KA's)

ANSWER: 100 (1.00)

a. [+1.0]

REFERENCE:

1. IG: RO-02-04-02, "Condensate and Feedwater Systems", T.-25; ELO 42.

   [3.2/3.3]

   295019K203 ..(KA's)

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

R O E x a m B W R R e a c t o r

O r g a n i z e d b y Q u e s t i o n N u m b e r

QUESTION	VALUE	REFERENCE
001	1.00	14073
002	1.00	9000001
003	1.00	9000002
004	1.00	9000003
005	1.00	9000004
006	1.00	9000005
007	1.00	9000006
008	1.00	9000007
009	1.00	9000008
010	1.00	9000009
011	1.00	9000010
012	1.00	9000011
013	1.00	9000012
014	1.00	9000013
015	1.00	9000014
016	1.00	9000018
017	1.00	9000019
018	1.00	9000020
019	1.00	9000021
020	1.00	9000022
021	1.00	9000023
022	1.00	9000024
023	1.00	9000025
024	1.00	9000026
025	1.00	9000027
026	1.00	9000028
027	1.00	9000029
028	1.00	9000030
029	1.00	9000031
030	1.00	9000032
031	1.00	9000033
032	1.00	9000034
033	1.00	9000035
034	1.00	9000036
035	1.00	9000037
036	1.00	9000038
037	1.00	9000039
038	1.00	9000040
039	1.00	9000041
040	1.00	9000042
041	1.00	9000043
042	1.00	9000044
043	1.00	9000045
044	1.00	9000046
045	1.00	9000047
046	1.00	9000048

R O E x a m B W R R e a c t o r

O r g a n i z e d b y Q u e s t i o n N u m b e r

QUESTION	VALUE	REFERENCE
047	1.00	9000049
048	1.00	9000050
049	1.00	9000051
050	1.00	9000052
051	1.00	9000053
052	1.00	9000054
053	1.00	9000055
054	1.00	9000056
055	1.00	9000057
056	1.00	9000058
057	1.00	9000059
058	1.00	9000060
059	1.00	9000061
060	1.00	9000062
061	1.00	9000063
062	1.00	9000064
063	1.00	9000065
064	1.00	9000066
065	1.00	9000067
066	1.00	9000069
067	1.00	9000070
068	1.00	9000071
069	1.00	9000072
070	1.00	9000073
071	1.00	9000074
072	1.00	9000075
073	1.00	9000076
074	1.00	9000077
075	1.00	9000078
076	1.00	9000079
077	1.00	9000080
078	1.00	9000082
079	1.00	9000085
080	1.00	9000088
081	1.00	9000089
082	1.00	9000096
083	1.00	9000097
084	1.00	9000098
085	1.00	9000101
086	1.00	9000102
087	1.00	9000103
088	1.00	9000104
089	1.00	9000105
090	1.00	9000109
091	1.00	9000111
092	1.00	9000113

R O E x a m B W R R e a c t o r

O r g a n i z e d b y Q u e s t i o n N u m b e r

QUESTION	VALUE	REFERENCE
093	1.00	9000114
094	1.00	9000116
095	1.00	9000118
096	1.00	9000119
097	1.00	9000120
098	1.00	9000121
099	1.00	9000122
100	1.00	9000123
	100.00	
	100.00	

RO Exam BWR Reactor

Organized by KA Group

PLANT WIDE GENERICS

QUESTION	VALUE	KA
014	1.00	294001A102
005	1.00	294001A103
015	1.00	294001A108
003	1.00	294001A109
012	1.00	294001A112
013	1.00	294001A114
007	1.00	294001A116
004	1.00	294001A116
002	1.00	294001K101
006	1.00	294001K102
009	1.00	294001K103
008	1.00	294001K104
010	1.00	294001K105
011	1.00	294001K116
PWG Total	14.00	

PLANT SYSTEMS

Group I

QUESTION	VALUE	KA
041	1.00	201001K108
016	1.00	201001K203
018	1.00	201002K402
044	1.00	202002K406
033	1.00	203000K411
023	1.00	206000K402
022	1.00	206000K403
020	1.00	206000K406
040	1.00	209001K401
039	1.00	209001K401
054	1.00	209001K402
024	1.00	211000G004
017	1.00	212000K106
025	1.00	212000K412
027	1.00	215004K102
026	1.00	215004K602
034	1.00	215005A107
021	1.00	216000A101
043	1.00	217000A105
028	1.00	217000G007
029	1.00	218000G004
035	1.00	223001K501
036	1.00	223002A302

R O E x a m B W R R e a c t o r

O r g a n i z e d b y K A G r o u p

PLANT SYSTEMS

Group I

QUESTION	VALUE	KA
030	1.00	239002A407
037	1.00	241000K302
031	1.00	259002K501
038	1.00	261000A409
019	1.00	264000K407
032	1.00	264000K602
PS-I Total	29.00	

Group II

QUESTION	VALUE	KA
053	1.00	201003A203
045	1.00	201006K404
046	1.00	202001K306
058	1.00	204000G010
047	1.00	204000K404
048	1.00	205000K402
049	1.00	214000K104
050	1.00	215002K401
055	1.00	219000A301
056	1.00	226001A105
051	1.00	245000A402
061	1.00	256000K304
060	1.00	262001A301
057	1.00	263000K201
052	1.00	271000K111
042	1.00	272000K102
062	1.00	290001A301
059	1.00	290003K107
PS-II Total	18.00	

Group III

QUESTION	VALUE	KA
064	1.00	215001A207
065	1.00	215001K105
001	1.00	233000K306
063	1.00	288000A301
PS-III Total	4.00	

R O E x a m B W R R e a c t o r

O r g a n i z e d b y K A G r o u p

PLANT SYSTEMS

	QUESTION	VALUE	KA
PS Total		51.00	

EMERGENCY PLANT EVOLUTIONS

Group I

QUESTION	VALUE	KA
066	1.00	295005G005
067	1.00	295006G010
068	1.00	295007K205
070	1.00	295009K202
072	1.00	295010G011
071	1.00	295010K202
073	1.00	295014A102
078	1.00	295014A203
074	1.00	295014K211
075	1.00	295015A101
077	1.00	295037K203
076	1.00	295037K210
EPE-I Total	12.00	

Group II

QUESTION	VALUE	KA
083	1.00	295001K304
084	1.00	295002K103
090	1.00	295003G006
091	1.00	295003G007
082	1.00	295004A202
096	1.00	295004A204
099	1.00	295008A104
069	1.00	295008A202
088	1.00	295012K101
079	1.00	295013G011
081	1.00	295016A106
080	1.00	295016K202
085	1.00	295018G010
095	1.00	295018K202
086	1.00	295019A201
100	1.00	295019K203
087	1.00	295020A101
097	1.00	295020A205

R O E x a m B W R R e a c t o r

O r g a n i z e d b y K A G r o u p

EMERGENCY PLANT EVOLUTIONS
Group II

QUESTION	VALUE	KA
089	1.00	295022K202
098	1.00	295034K204
EPE-II Total	20.00	

Group III

QUESTION	VALUE	KA
092	1.00	295021A206
094	1.00	295023G007
093	1.00	295032G011
EPE-III Total	3.00	
EPE Total	35.00	
Test Total	100.00	

Attachment 2

Senior Reactor Operator Examination

and Answer Key

U. S. NUCLEAR REGULATORY COMMISSION
SITE SPECIFIC EXAMINATION
SENIOR OPERATOR LICENSE
REGION 1

CANDIDATE'S NAME: MASTER

FACILITY: Pilgrim 1

REACTOR TYPE: BWR-GE3

DATE ADMINISTERED: 91/12/02

INSTRUCTIONS TO CANDIDATE:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

TEST VALUE	CANDIDATE'S SCORE	%	
98.00 B ~~100.00~~ (12-9-91)		%	TOTALS
	FINAL GRADE		

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

Candidate's Signature

A N S W E R K E Y

MULTIPLE CHOICE

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

A N S W E R K E Y

046	a	069	b
047	b	070	c
048	b	071	d
049	c	072	d
050	c	073	b
051	b	074	d
052	d	075	c
053	a	076	d
054	a	077	a
055	d	078	a
056	c	079	d
057	c	080	c
058	d	081	d
059	c	082	d
060	c	083	d
061	a	084	a
062	b	085	b
063	c	086	d
064	c	087	b
065	c	088	d
~~066~~	~~c~~ deleted	089	d
067	d	090	d
068	d	091	b

A N S W E R K E Y

092 d

093 a

094 a

095 d

096 d

097 d

098 d

099 b

100 b

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

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

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

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

046	a	b	c	d	___	069	a	b	c	d	___
047	a	b	c	d	___	070	a	b	c	d	___
048	a	b	c	d	___	071	a	b	c	d	___
049	a	b	c	d	___	072	a	b	c	d	___
050	a	b	c	d	___	073	a	b	c	d	___
051	a	b	c	d	___	074	a	b	c	d	___
052	a	b	c	d	___	075	a	b	c	d	___
053	a	b	c	d	___	076	a	b	c	d	___
054	a	b	c	d	___	077	a	b	c	d	___
055	a	b	c	d	___	078	a	b	c	d	___
056	a	b	c	d	___	079	a	b	c	d	___
057	a	b	c	d	___	080	a	b	c	d	___
058	a	b	c	d	___	081	a	b	c	d	___
059	a	b	c	d	___	082	a	b	c	d	___
060	a	b	c	d	___	083	a	b	c	d	___
061	a	b	c	d	___	084	a	b	c	d	___
062	a	b	c	d	___	085	a	b	c	d	___
063	a	b	c	d	___	086	a	b	c	d	___
064	a	b	c	d	___	087	a	b	c	d	___
065	a	b	c	d	___	088	a	b	c	d	___
066	a	b	c	d	___	089	a	b	c	d	___
067	a	b	c	d	___	090	a	b	c	d	___
068	a	b	c	d	___	091	a	b	c	d	___

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

092	a	b	c	d	___
093	a	b	c	d	___
094	a	b	c	d	___
095	a	b	c	d	___
096	a	b	c	d	___
097	a	b	c	d	___
098	a	b	c	d	___
099	a	b	c	d	___
100	a	b	c	d	___

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

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 applicant 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 and each answer sheet.

6. Mark your answers on the answer sheet provided. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

7. 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.

8. 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.

9. The point value for each question is indicated in parentheses after the question.

10. Show all calculations, methods, or assumptions used to obtain an answer to any short answer questions.

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

12. 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.

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

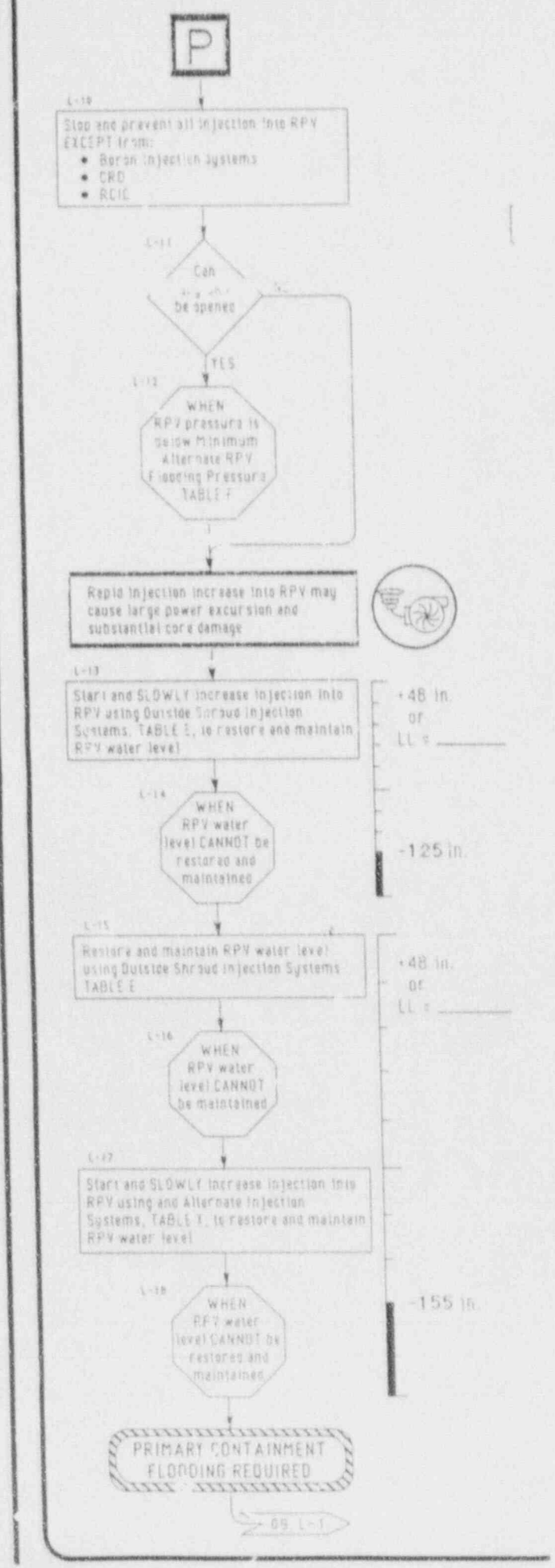
14. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.

15. Ensure all information you wish to have evaluated as part of your answer is on your answer sheet. Scrap paper will be disposed of immediately following the examination.

16. To pass the examination, you must achieve a grade of 80% or greater.

17. There is a time limit of four (4) hours for completion of the examination.

18. When you are done and have turned in your examination, leave the examination area (EXAMINER WILL DEFINE THE AREA). If you are found in this area while the examination is still in progress, your license may be denied or revoked.


P
L-10
Stop and prevent all injection into RPV EXCEPT from:
• Boron Injection Systems
• CRD
• RCIC
L-11
Can
be opened
YES
L-12
WHEN RPV pressure is below Minimum Alternate RPV Flooding Pressure TABLE F
Rapid injection increase into RPV may cause large power excursion and substantial core damage
L-13
Start and SLOWLY increase injection into RPV using Outside Shroud Injection Systems, TABLE E, to restore and maintain RPV water level
+48 in.
or
LL =
L-14
WHEN RPV water level CANNOT be restored and maintained
-125 in.
L-15
Restore and maintain RPV water level using Outside Shroud Injection Systems TABLE E
+48 in.
or
LL =
L-16
WHEN RPV water level CANNOT be maintained
L-17
Start and SLOWLY increase injection into RPV using and Alternate Injection Systems, TABLE F, to restore and maintain RPV water level
L-18
WHEN RPV water level CANNOT be restored and maintained
-155 in.
PRIMARY CONTAINMENT FLOODING REQUIRED
09, L-1

1

RPV WATER LEVEL INSTRUMENTS

An RPV water level instrument is usable only when instrument run temperatures are below RPV Saturation Temperature, FIGURE 1

AND:

- Temperatures near instrument reference leg vertical runs, procedure 2.1.27, are below following:

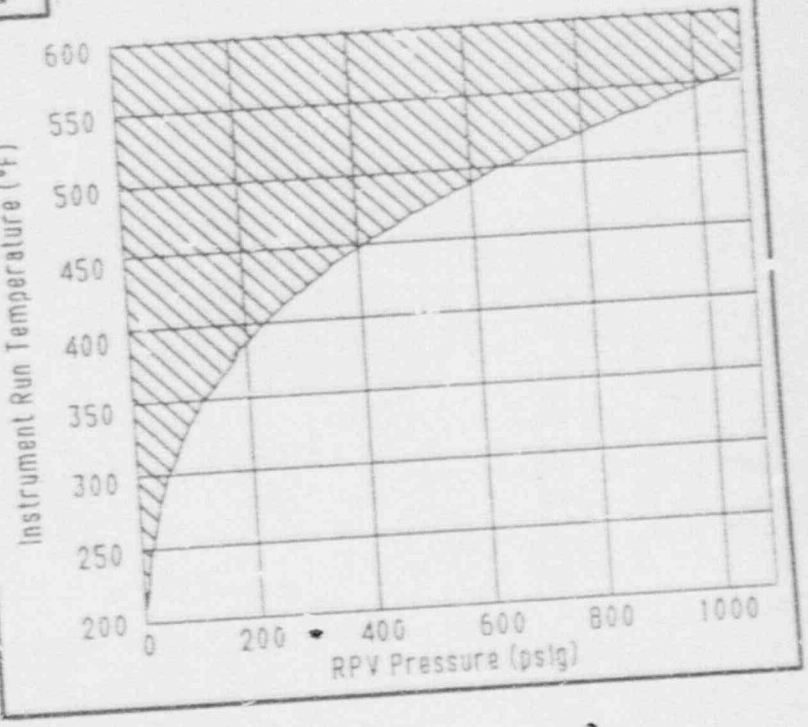
Narrow	Fuel Zone	FW Control
RB access	220 °F in DW	none

OR

- Water level reading is above red zone:

1

RPV SATURATION TEMPERATURE
SPDS 032



QUESTION: 001 (1.00)

WHICH ONE of the following is a concern associated with increasing fuel pool temperature?

a. Increased airborne radioactivity.

b. Stored fuel overheating damage.

c. Fuel pool structural damage.

d. Indicates criticality.

QUESTION: 002 (1.00)

WHICH ONE of the following methods must be used when performing an independent verification of a tagout for a deenergized valve that is inaccessible?

a. Rack in its associated breaker and verify the position using remote indication.

b. The NOS log book is the official record of valve position and used for verifying valve position.

c. If the valve is associated with an system line-up procedure, the previous system line-up procedure can be used to verify valve position.

d. For valves that are associated with an existing Tagout, the existing Tagout can be used to verify valve position.

QUESTION: 003 (1.00)

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.

QUESTION: 004 (1.00)

WHICH ONE of the following statements describes a ALERT emergency level classification event?

a. Events that involve major failures of plant functions needed for public protection and a likely release of radioactive material.

b. Events that involve a substantial degradation of the level of safety of the plant with no offsite release expected.

c. Events that involve core degradation with possible loss of containment.

d. Events that indicate a potential degradation of the level of safety of the plant.

QUESTION: 005 (1.00)

WHICH ONE of the following contains the minimum radiation level that require a Regular or Extended Radiation Work Permit (RWP)?

a. 1 Rem/hr

b. .1 Rem/hr

c. .01 Rem/hr

d. .001 Rem/hr

QUESTION: 006 (1.00)

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

SELECT the statement that describes the operating concerns of the CRD pump.

a. The pump cannot be operated except at the request of the permit holder.

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.

QUESTION: 007 (1.00)

WHICH ONE of the following PNPS emergency alarms is associated with an Emergency Site Evacuation?

a. Siren

b. Fast Warble

c. High Continuous Pitch

d. Fast Beep

QUESTION: 008 (1.00)

PNPS lead shielding program requirements are established under the supervision of ...

a. Maintenance personnel

b. ALARA engineers

c. NWE and staff

d. QA personnel

QUESTION: 009 (1.00)

A radiological survey of an area has the following results:

- 51 mrem/hr general radiation
- 125 dpm/100 cm2 loose surface
- 15 dpm/100 cm2 loose surface alpha
- .18 mpc airborne concentrations

Based on the survey results, WHICH ONE of the following states the COMPLETE posting(s) required?

a. Contamination Area

b. Radiation Area

c. Airborne Radioactivity Area.

d. High Radiation Area.

QUESTION: 010 (1.00)

WHICH ONE of the following identifies ONLY those individuals that are authorized to escort visitors at PNPS?

a. Any PNPS employee who is permanently badged.

b. Any PNPS employee who has received General Employee Training.

c. Any PNPS employee who has a security badge with a yellow background.

d. Any PNPS employee who has been approved by security.

QUESTION: 011 (1.00)

During a plant outage a fire in the drywell develops. You are a member of the fire brigade reporting to the scene. WHICH ONE of the following is considered to be one of your immediate actions?

a. Notify Radiological Protection management and ensure that they will be assisting the Fire Brigade.

b. Request that Security personnel activate the Radiax Communication System.

c. Clear cords, and any equipment not used for fire fighting from all hatches.

d. Dispatch a Nuclear Plant Operator to the Intake Structure to monitor fire pump performance.

QUESTION: 012 (1.00)

Procedure 3.21, "Bypass Selected Interlocks," is used under emergency conditions when normal control systems have failed. SELECT the person whose authorization is specifically required prior to installing a bypass jumper.

a. The SCRE

b. The STA

c. The NOS

d. The NWE

QUESTION: 013 (1.00)

WHICH ONE of the following states the MINIMUM reactor water conductivity level that would require an orderly reactor shutdown?

a. 11 umhos/cm

b. .1 umhos/cm

c. 10 ppb

d. .1 ppm

QUESTION: 014 (1.00)

The reactor has scrammed due to a loss of level and EOP-01 (RPV CONTROL) has been entered. During the execution of EOP-01, a high drywell pressure entry condition occurs. WHICH ONE of the following actions should be taken?

a. Enter EOP-04, Secondary Containment Control AND EOP-03, Primary Containment Control.

b. Finish execution of the EOP-01, RPV Control, THEN enter EOP-03, Primary Containment Control.

c. Re-enter EOP-01, RPV Control AND enter EOP-03 Primary Containment Control.

d. Exit EOP-01, RPV Control, THEN enter EOP-03, Primary Containment Control.

QUESTION: 015 (1.00)

SELECT the thermal limit that is the ratio of actual bundle power to the bundle power that is required to produce 25 degree temperature swings within the bundle.

a. APLHGR

b. MCPR

c. MAPRAT

d. FLPD

QUESTION: 016 (1.00)

When performing a procedure that requests for the placement of electrical jumpers/lifting of electrical leads, WHICH ONE of the following would require an entry into the Lifted Lead/Jumper Log (LLJ)?

a. The jumper lifted lead condition will not be returned to its normal configuration prior to the end of the current NWE working shift and the Maintenance Request provides for relanding the leads prior to clearing the isolation boundary tags.

b. The jumper lifted lead condition is supported by an EOP support procedure and emergency conditions warrant the placement of electrical jumpers/lifting of electrical leads.

c. The leads lifted are motor leads that fall within the Maintenance Request (MR) tagout boundary, which have been identified with colored tape by maintenance, and the MR provides for relanding the leads prior to clearing the isolation boundary.

d. The placing of the jumper/lifting of the lead and removal of the jumper/landing of the lead are sign-off steps in the procedure and the jumper lifted lead condition is back to normal before the end of the NWE working shift.

QUESTION: C17 (1.00)

The 'A' SLC pump is being tagged-out for maintenance while the 'B' SLC pump is to remain operable. SELECT the statement that describes the tagging that is used for the common control switch on Panel 905.

a. The control switch is Red tagged with a notation on the tag that only the "SYS A' position is affected.

b. The control switch is Green tagged and work group authorization is required to take the switch to the "SYS B" position.

c. The control switch is Yellow tagged with a notation on the tag that "SYS B" remains operable.

d. The control switch is Red tagged and the tagout procedure is revised using an "SRO Change" to allow operation of the control switch.

QUESTION: C18 (1.00)

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. Obtain a new High Pressure Cylinder Control Tag from the NWE or from tool management.

c. Notify the NWE immediately who will properly dispose of the issue.

d. Retrieve the Controlled Chemical/Chemical Material Permit before requesting a new HPCCT.

QUESTION: 019 (1.00)

WHICH ONE of the following completes the statement below?

The backup scram valves are ____(1)____ powered solenoid valves; and these solenoid valves _____(2)_____ to isolate and vent off the scram air header.

a. (1) 125 VDC; and (2) deenergize.

b. (1) 125 VDC; and (2) energize.

c. (1) 120 VAC; and (2) deenergize.

d. (1) 120 VAC; and (2) energize.

QUESTION: 020 (1.00)

WHICH ONE of the following is a an accurate response for filling in the blanks?

The minimum number of RPS CHANNEL TRIPS required to cause a FULL SCRAM is _____(1)_____.

The minimum number of BACKUP SCRAM VALVES needed to cause a FULL SCRAM is _____(2)_____.

a. (1) ONE, (2) ONE.

b. (1) ONE, (2) TWO.

c. (1) TWO, (2) ONE.

d. (1) TWO, (2) TWO.

QUESTION: 021 (1.00)

If the Reactor Manual Control (RMC) master timer fails, the RMC system interlock that prevents uncontrolled rod withdrawal using the Rod Movement Control Switch ONLY, is accomplished 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 last more than 1.5 seconds.

c. the auxiliary timer generates an Insert Block if the notch sequence last longer than 2 seconds.

d. the automatic sequence timer will generate both an Insert and Withdrawal Block after 1.5 seconds.

QUESTION: 022 (1.00)

WHICH ONE of the following describes how an emergency diesel generator would be effected if its four isolation switches, located in the alternate shutdown panel, were placed in the "LOCAL" position.

a. Isolates the remote DG fuel pump start function.

b. Locks the DG in the isochronous mode.

c. Remove the voltage regulator auto function.

d. Cut out all diesel automatic shutdowns except low oil level and overspeed.

QUESTION: 023 (1.00)

WHICH ONE of the following methods is used to maintain the High Pressure Coolant Injection (HPCI) System piping full of water in its normal operational line up?

a. The hydrostatic head from the torus.

b. The hydrostatic head from the condensate storage tank (CST).

c. The discharge pressure from the ECCS Keep Fill Pump.

d. The discharge pressure from the condensate transfer pumps.

QUESTION: 024 (1.00)

WHICH ONE of the following describes the expected effects on reactor level indication if elevated temperatures exist in the drywell?

a. There is no expected change for the wide range and FWLC narrow range.

b. Higher than actual level indications on the FWLC narrow range.

c. Lower than actual level indications on the FWLC narrow range.

d. Lower than actual level indications on the wide range and FWLC narrow range.

QUESTION: 025 (1.00)

The High Pressure Coolant Injection (HPCI) Turbine has isolated from a faulty low steam supply pressure signal. An automatic HPCI initiation signal due to high drywell pressure then occurs. If the turbine isolation condition clears, while the drywell pressure is still high, what is the method of resetting the HPCI Turbine for restart?

a. Depressing the RESET button on the 903 panel and manually opening Valve 2301-4.

b. Depressing the RESET button on the 903 panel and valve 2301-4 opens automatically.

c. Allowing the turbine trip to reset automatically and manually opening valve 2301-4.

d. Allowing the turbine trip to reset automatically and valve 2301-4 opens automatically.

QUESTION: 026 (1.00)

Given the plant conditions, WHICH ONE of the following completes the statement below?

PLANT CONDITIONS

- Loss of Coolant Accident (LOCA) is in progress,
- High Pressure Coolant Injection (HPCI) initiation signal present,
- Condensate Storage Tank (CST) level is 25 inches above tank zero,
- suppression pool level is +6.5 inches,
- reactor pressure is 105 psig.

The HPCI Steam Supply Isolation Valves, 2301-4 and 2301-5, automatically ___(1)___, the Torus Suction Valves, 2301-35 and 2301-36 automatically ___(2)___, the CST Suction Valve, 2301-6, automatically ___(3)___.

a. (1) open if closed, (2) open, (3) closes.

b. (1) close if open, (2) open, (3) closes.

c. (1) close if open, (2) close, (3) closes.

d. (1) open if closed, (2) close, (3) opens.

QUESTION: 027 (1.00)

The purpose of the Standby Liquid Control (SBLC) Pump Discharge Accumulator is to...

a. provide a means of injection during a failure of both SBLC pumps.

b. prevent spurious operation of the discharge relief valves when both pumps are running.

c. minimize pulsations in system discharge pressure.

d. ensure sodium pentaborate remains suspended in solution.

QUESTION: 028 (1.00)

WHICH ONE of the following RPS scram signals is ACTIVE when the reactor mode switch is in the STARTUP Position.

a. APRM high flux (flow biased)

b. APRM downscale with companion IRM high.

c. Low MHC fluid pressure.

d. High main steam line radiation.

QUESTION: 029 (1.00)

The 24 VDC power to channel 'A' Source Range Monitor (SRM) preamplifier is interrupted and immediately restored, resulting in channel 'A' SRM output trips and alarms.

SELECT the statement that describes what situation can occur (assume no operator actions).

a. A DOWNSCALE/INOP rod block was generated, however, the block cleared automatically when power was restored.

b. An DOWNSCALE/INOP rod block was generated and must be reset on the 936 Panel before further rod withdrawal can take place.

c. A DOWNSCALE/INOP rod block was not generated, because the HV power supply was not affected.

d. A DOWNSCALE/INOP rod block was generated and must be reset on the 905 Panel before further rod withdrawal can take place.

QUESTION: 030 (1.00)

Given that:

- Intermediate Range Monitor (IRM) Channel 'E' is on Range 2.
- IRM Channels 'B', 'H', 'G', 'D', and 'A' are on Range 3.
- IRM Channels 'C' and 'F' are bypassed.
- Mode Switch is in STARTUP.
- All SRM channels are fully inserted.

WHICH ONE of the following describes the retract permit rod block status if SRM channel 'D' is retracted until a level of 90 counts per minute is achieved?

a. A rod block is in effect due to an IRM channel on Range 2.

b. A rod block is in effect due to SRM Channel D reading less than 100 counts per minute.

c. There is no effect since the IRM's indicate at the point of adding heat.

d. There is no effect since associated IRM's are on Range 3 or bypassed.

QUESTION: 031 (1.00)

WHICH ONE of the following Reactor Core Isolation Cooling (RCIC) trips/isolations can be reset inside the control room when the RCIC Turbine Reset Button is depressed?

a. Turbine overspeed.

b. Low pump suction pressure.

c. High reactor vessel level.

d. Low turbine RPM.

deleted
see facility
comments
8

QUESTION: 032 (1.00)

The automatic depressurization system (ADS) is...

a. part of the safety valves and acts as a backup to the Reactor Core Isolation Cooling (RCIC) System.

b. an Engineered Safety Feature (ESF) and acts as a backup to the Core Spray (CS) System.

c. a pressure relief system for Group 1 isolation and acts as backup to the safety valves.

d. part of the Emergency Core Cooling System (ECCS) and acts as a backup to the High Pressure Coolant Injection (HPCI) System.

QUESTION: 033 (1.00)

Plant conditions are as follows:

- single element level control.
- reactor water level of +25 inches.
- master level controller set at +30 inches in AUTOMATIC.
- "\" FRV fully closed in MANUAL.

If the MAN/AUTO signals were NOT matched when the "A" FRV is placed into BALANCE, the "A" FRV will...

a. OPEN in response to the level error.

b. OPEN if feed flow is less than steam flow.

c. REMAIN CLOSED, because the controller is in single element control.

d. REMAIN CLOSED, because automatic level control mode of the "A" FRV is disabled at PNPS.

QUESTION: 034 (1.00)

A loss of offsite power has required the diesel generators to operate at full load to supply emergency power for the last three hours. An annunciator has just come in indicating that a low Day Tank level condition exists for one of the diesel generators. WHICH ONE of the following states how much longer the effected diesel generator can be expected to operate if its fuel transfer pump has not operated since the diesel had started?

a. Until the main fuel oil tank is empty.

b. One hour.

c. Four hours.

d. Eight hours.

QUESTION: 035 (1.00)

During plant operation in the RUN mode the drywell pressure reaches 2.7 psig.

- Reactor pressure is currently 300 psig.
- When LPCI loop logic is initiated differential pressure across recirc. pumps A and B are greater than 2 psid.
- Loop A jet pump riser pressure is more than one psid greater than loop B jet pump riser pressure two seconds after the LPCI loop logic is initiated.
- Recirculation pumps A and B are tripped.

Based on the above data, WHICH ONE of the following automatic actions occurs?

a. -Injection valve 2[illegible]B is interlocked closed for 10 minutes
-Recirc pump A discharge valve is closed
-Injection valve 2[illegible]A is interlocked open for 5 minutes

b. -Injection valve 2[illegible]A is interlocked closed for 10 minutes
-Recirc pump B discharge valve is closed
-Injection valve 2[illegible]B is interlocked open for 5 minutes

c. -Injection valve 2[illegible]A is interlocked closed for 10 minutes
-Recirc pump A discharge valve is closed
-Injection valve 2[illegible]B is interlocked open for 5 minutes

d. -Injection valve 2[illegible]B is interlocked closed for 10 minutes
-Recirc pump A discharge valve is closed
-Recirc pump B discharge valve is closed
-Injection valve 2[illegible]A is interlocked open for 5 minutes

corrected during exam

QUESTION: 036 (1.00)

At 85% reactor power the APRM Calibration section of the OD-3 Printout provided the following results:

APRM	1	2	3	4	5	6
READING	84.7	83.8	85.0	85.0	85.3	84.7
AGAF	1.015	1.206	1.001	0.985	0.970	1.019

WHICH ONE the following identifies ALL the APRMs that require adjustment to read correctly?

a. APRM 4 and APRM 5

b. APRM 1 and APRM 2 and APRM 5

c. APRM 2 and APRM 5

d. APRM 1 and APRM 2 and APRM 3 and APRM 6

QUESTION: 037 (1.00)

WHICH ONE of the following describes the operation of the Reactor Building to TORUS air operated butterfly vacuum breakers. ASSUME the reactor building pressure is at a constant 14.5 psia.

a. Vacuum breaker valves automatically open at a torus pressure of 14.0 psia unless a secondary containment isolation signal is present.

b. Vacuum breaker valves automatically open at a torus pressure of 14.0 psia even if a secondary containment isolation signal is present.

c. Vacuum breaker valves automatically open at a torus pressure of 14.25 psia unless a secondary containment isolation signal is present.

d. Vacuum breaker valves automatically open at a torus pressure of 14.25 psia even if a secondary containment isolation signal is present.

QUESTION: 038 (1.00)

WHICH of the following statements contains ALL the conditions that will cause the hydrogen/oxygen (H2/O2) analyzer system to isolate?

a. Reactor water level +5", drywell pressure 3.1 psig

b. Reactor pressure 95 psig, drywell pressure 2.5 psig

c. Reactor water level -50", O2 concentration less than 4%

d. Reactor water level +8", reactor pressure 75 psig.

QUESTION: 039 (1.00)

While at power in the RUN mode, with the EPR in control, a failure in the EPR setpoint control switch (located on panel C-2) causes the EPR setpoint to steadily lower. WHICH ONE of the following describe the plant response?

a. Reactor pressure will decrease and the MPR will take over control when turbine inlet pressure decreases to the MPR setpoint.

b. Reactor pressure will increase and the MPR will take over control when turbine inlet pressure increases to the MPR setpoint.

c. Reactor pressure will increase to the point which will cause a reactor scram on high reactor pressure.

d. Reactor pressure will decrease to the point in which a Group 1 isolation will occur.

QUESTION: 040 (1.00)

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 the 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.

QUESTION: 041 (1.00)

All of the following are conditions that will result in a "Core Spray Break Detection" Annunciator when the reactor is at rated power EXCEPT:

a. A break occurs in the injection line between the vessel and the shroud.

b. The above core plate tap to the differential pressure transmitter breaks at the d/p transmitter.

c. The differential pressure transmitter diaphragm develops a hole which equalizes pressure across the detector.

d. A break occurs in the injection line between the vessel and the injection check valve (9 A/B).

QUESTION: 042 (1.00)

WHICH ONE of the following describes the MINIMUM parameter(s), for which, the Rod Worth Minimizer System LPAP is BYPASSED.

a. Steam flow OR feed flow greater than 35%.

b. Steam flow greater than 20% for at least 5 seconds.

c. Steam flow greater than 35%.

d. Steam flow AND feed flow greater than 20% for at least 5 seconds.

QUESTION: 043 (1.00)

The reason for maintaining recirculation pump speed between within 10% of each other when reactor power is greater than 85% is to prevent...

a. power instability.

b. cavitation of recirculation pumps and jet pumps.

c. temperature stratification in the vessel.

d. an error in the LPCI loop selection logic.

QUESTION: 044 (1.00)

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.

QUESTION: 045 (1.00)

Concerning the residual heat removal system (RHRS), during the shutdown cooling mode, protective interlocks close suction valves MO-1001-47 and MO-1001-50 and assures that they remain closed. WHICH ONE of the following states the reason for the protective interlocks?

a. Protects RHRS low pressure piping from high reactor pressures.

b. Protects vessel components from severe cool down rates.

c. Protect the RHR pumps from cavitation.

d. Protects against thermal stratification developing in the core.

QUESTION: 046 (1.00)

WHICH ONE of the following states the automatic rod block that occurs, if power is lost to the Rod Position Information System (RPIS).

a. select block.

b. withdrawal block.

c. insert block.

d. notch override block.

QUESTION: 047 (1.00)

WHICH ONE of the following will allow the Rod Block Monitor (RBM) to remain operable?

a. Function Switch in "Not in Operate".

b. Only sixty percent of the assigned inputs are operable.

c. More than one control rod selected.

d. Failure to null.

QUESTION: 048 (1.00)

The Main Generator is on line in Auto Voltage Control. The transfer voltmeter is maintained nulled to allow for a smooth transfer to manual should the voltage regulator fail. WHICH ONE of the following is used to maintain the meter nulled?

a. Voltage regulator transfer switch.

b. Manual voltage adjuster control switch.

c. Exciter field control switch.

d. Auto voltage adjuster control switch.

QUESTION: 049 (1.00)

The process that is used in the charcoal beds to reduce the off-gas radioactive release to the environment is by removing...

a. hydrogen gas isotopes using catalytic recombination and condensation.

b. radioactive particulates using high efficiency filtration.

c. noble gas isotopes using adsorption and decay

d. nitrogen gas isotopes using holdup and decay.

QUESTION: 050 (1.00)

WHICH ONE of the following would explain why both Recirculation MG sets tripped and the only annunciator in alarm says "Loss Of DC Supply".

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.

QUESTION: 051 (1.00)

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.

QUESTION: 052 (1.00)

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

QUESTION: 053 (1.00)

A Transverse Incore Probe (TIP) becomes mechanically bound inside the RPV. Subsequently, a valid Group 2 Isolation condition occurs. WHICH ONE of the following describes the actions necessary to isolate the containment in this situation?

a. The Shear Valve must be shut manually.

b. The Shear Valve will automatically close.

c. The Ball Valve will automatically close.

d. The Ball and the Shear Valve will receive automatic isolation signals.

QUESTION: 054 (1.00)

WHICH ONE of the following describes the response of the Traversing Incore Probe (TIP) to a reactor scram in which RPV level decreases to -13 inches while the detector is in the core? ASSUME the detector is being operated in the manual mode at the TIP control panel.

a. The TIP detector is automatically withdrawn from the core and when the detector clears the ball valve, the ball valve will automatically close.

b. The TIP detector is automatically withdrawn from the core and when clear of the ball valve, a permissive is provided to allow manually closure of the ball valve.

c. The TIP detector will remain in the core and the shear valve will automatically actuate.

d. The TIP detector remains in the manual mode and can be withdrawn as part of the manual operation.

QUESTION: 055 (1.00)

WHICH ONE of the following completes the statement given below. Assume full power normal operations.

With three feedpumps operating the loss of one feedwater flow input signal corresponds to a _____(1)____ and the resultant flow error demands _____(2)_____ feedwater flow.

a. (1) 33% feedwater signal loss
   (2) less

b. (1) 33% feedwater signal loss
   (2) more

c. (1) 50% feedwater signal loss
   (2) less

d. (1) 50% feedwater signal loss
   (2) more

QUESTION: 056 (1.00)

WHICH ONE of the following completes the statement given below. Assume full power normal operations.

The feedwater level control (FWLC) system has lost one of its steam flow input signals. This will cause steam flow to indicate 75% and the FRVs will _____(1)_____ and the reactor vessel level will_____(2)_____.

a. (1) close
   (2) decrease and the reactor will scram

b. (1) go full open
   (2) increase and trip the main turbine

c. (1) start closing
   (2) decrease but will not scram

d. (1) start opening
   (2) increase but not trip the main turbine

QUESTION: 057 (1.00)

EOP-03, the Primary Containment Pressure Control leg, does NOT allow the operator to start drywell sprays if the torus water level is greater than 180". WHICH ONE of the following describes the reason for this restriction on using drywell spray?

a. This prevents drywell chugging.

b. This prevents excessive dynamic loading on the drywell vent downcomers.

c. This prevents proper operation of the torus/drywell vacuum breaker.

d. This ensures adequate suppression chamber air space volume to receive drywell drainage.

QUESTION: 058 (1.00)

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-3 (Primary Containment Control).

d. EOP-01, and EOP-03.

QUESTION: 059 (1.00)

With reactor power at 50%, the "A" Reactor Recirculation (RR) Pump begins to steadily increase speed at about 1% per second. Depressing the Scoop Tube Lock Reset has NOT stopped the transient. Reactor power and recirculation flow continue to increase. WHICH ONE of the following describes the next IMMEDIATE OPERATOR ACTION that should be taken to terminate this transient?

a. Scram the reactor.

b. Trip both RR Pumps.

c. Trip RR Pump "A".

d. Lock the Scoop Tube locally.

QUESTION: 060 (1.00)

The power to flow map shows an instability region above the 80% rod line and has identified them as regions A, B and C. WHICH ONE of the following responses may result from operating in these regions?

a. The APRMs may fail to generate a reactor trip signal when required.

b. Flow oscillations may result in a loss of net positive suction head to the Reactor Recirculation Pumps.

c. Localized and core wide power oscillations may require a manual reactor scram.

d. LPRM cycles from high alarm to low alarm may cause an increased instrument failure rate.

QUESTION: 061 (1.00)

In accordance with PNPS procedure No. 5.3.23, "Alternate Rod Insertion," following an incomplete scram, WHICH ONE of the following methods for inserting control rods requires the scram to be reset?

a. Insert a manual Scram from panel 905.

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

c. Maximizing drive water pressure for control rod insertion.

d. Venting the scram air header.

QUESTION: 062 (1.00)

WHICH ONE of the following completes the statement below?

The Anticipated Transient Without a Scram (ATWS) system trips with increasing reactor pressure at ____(1)____. One resulting automatic action of ATWS is to rapidly increase voiding in the core by tripping open the motor generator ____(2)____ breakers for the recirculation pumps.

a. (1) 1,175 psig, (2) drive.

b. (1) 1,175 psig, (2) field/drive.

c. (1) 1,075 psig, (2) drive.

d. (1) 1,075 psig, (2) field/drive.

QUESTION: 063 (1.00)

Given that:

- A scram has occurred due to low vessel level.
- Reactor power remains above 10% after the scram.
- Reactor vessel level is decreasing.

WHICH ONE of the following completes the statement below?

Alternate Rod Insertion (ARI) circuit trip occurs at a vessel level of ____(1)____ inches and ____(2)____ the ARI valve solenoids to vent the scram valve pilot air header.

a. (1) +9, (2) energizes.

b. (1) +9, (2) deenergizes.

c. (1) -49, (2) energizes.

d. (1) -49, (2) deenergizes.

QUESTION: 064 (1.00)

WHICH ONE of the following primary containment integrity considerations take precedence over adequate core cooling?

a. Torus water level and RPV pressure cannot be maintained below the SRV Tail Pipe Level Limit.

b. Drywell temperature cannot be maintained below 280 deg. F.

c. Torus bottom pressure cannot be maintained below the primary containment pressure limit.

d. Torus water temperature and RPV pressure cannot be maintained below the Heat Capacity Temperature Limit.

QUESTION: 065 (1.00)

The plant is operating at 95% power. A reactivity transient occurs which causes:

- APRM indication to decrease and return to 100%
- No change to total core flow
- Generator MW to decrease
- RPV level swells then lowers to below the original level

WHICH ONE of the following is the cause of the reactivity transient?

a. RCIC initiation

b. Reactor recirculation pump A speed increase

c. SRV stuck open

d. Feedwater heater isolation

deleted as facility comment's

QUESTION: 066 (1.00)

Concerning Procedure EOP-2, "Failure to Scram", the significance of the 1100 gal. change of SBLC tank level (or 8 drums of sodium pentaborate) value for injection is that at this value sufficient negative reactivity has been added to...

a. shutdown the reactor when RPV level is normal, all recirc. loops are open, the reactor is in hot standby and the reactor water cleanup system is in service with the filters and demineralizers bypassed.

b. satisfy the ATWS Rule (10 CFR 50.62) equivalency requirement and to assure that the reactor will be shutdown before unacceptable containment conditions develop.

c. overcome the combined effects of rated coolant voids, fuel doppler, Xenon, Samarium and temperature change plus shutdown margin from full power to less than 212 deg. F.

d. assure that the rate of positive reactivity insertion due to cool down of the reactor following the xenon peak is overridden by the rate of negative reactivity insertion due to boron injection.

QUESTION: 067 (1.00)

As a result of a total loss of power from the Vital AC bus (Y-2), procedure 5.3.6 requires that the operator immediately begin monitoring reactor water level on Panel 905.

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

a. The Reactor Feedwater Pump Minimum Flow Valves fail open.

b. The reactor level signals fail to zero.

c. High Pressure Coolant Injection automatically initiates.

d. The Feedwater Regulating Valves lock up.

QUESTION: 068 (1.00)

WHICH ONE of the following contains three (3) conditions that would require entry into EOP-03, "Primary Containment Control"?

a. Bulk drywell temperature 140 deg. F., drywell pressure 2.5 psig, torus water level 132 in. Wide Range.

b. Average torus water temperature is 81 deg. F, Bulk Drywell temperature is 151 deg. F, primary containment H2 concentrations are 3%.

c. Drywell pressure is 2.6 psig, reactor water level is +8 in. on the narrow range, and RPV pressure is 1090 psig.

d. Primary H2 concentrations are 5%, bulk drywell temperature is 151, drywell pressure is 2.8.

QUESTION: 069 (1.00)

When performing the "Torus Water Temperature" section of EOP-03, "Primary Containment Control", you are directed to a statement that says "BEFORE torus water temperature reaches Boron Injection Initiation Temperature", enter EOP-01 and perform concurrently. WHICH ONE of the following describes the reason for performing EOP-01, "RPV Control", concurrently?

a. To assure a condition does not occur that would compromise core cooling for torus cooling.

b. This reduces the potential for excessive heat energy being rejected to the torus by ensuring a scram signal is present.

c. This will assist in reducing an excessive heat load rejection to the torus by ensuring ADS is inhibited.

d. To assure cyclic condensation (chugging) does not occur when the torus sprays are placed in operation.

QUESTION: 070 (1.00)

WHICH ONE of the following describes the basis for opening the SRVs in a specified sequence?

a. Reduce the effect on the bottom torus pressure.

b. Reduce the effects on RCIC exhaust pressure.

c. Reduce the potential for localized overheating in the torus.

d. Reduce the potential for excessive wave motion in the torus.

QUESTION: 071 (1.00)

At full power operations an incident occurs requiring a control room evacuation. No time was available to reduce reactor power. You have been directed to trip all operating reactor feed pumps. WHICH ONE of the following states the location(s) where you would perform this action?

a. 23' RPS MG room and the 37' switch gear room.

b. 3' Aux Bay and the 23' reactor bldg.

' turbine bldg.

.7' switch gear room and the 23' switch gear room.

QUESTION: 072 (1.00)

An event has occurred that requires the control room to be evacuated and you have just directed the STA to monitor reactor water level. WHICH ONE of the following locations would the STA go to in order to monitor reactor water level?

a. Inst. rack 2258 at 2'9" in the RCIC quadrant.

b. -17'6" near the reactor sump.

c. 51' turbine bldg.

d. 51' reactor bldg.

QUESTION: 073 (1.00)

SELECT from the following statements the activity that requires a Refueling SRO to be present on the refueling floor.

a. During the de-tensioning and removal of the reactor vessel head.

b. Whenever installing or removing blade guides from the reactor core.

c. When placing new fuel bundles into the spent fuel pool.

d. Whenever the Reactor Building Crane is lifting loads of 1000 lbs or more over the spent fuel pool.

QUESTION: 074 (1.00)

During fuel handling operations with a bundle grappled over the core, the Refueling Floor Area Radiation Monitor (ARM) alarms. You are supervising on the refueling platform. SELECT the following statement that describes your immediate action(s) for this situation.

a Notify the Control Room to begin fuel pool makeup if time permits.

b Immediately terminate all fuel handling operations and leave the area.

c. Determine where the bundle was last located and replace it in that position.

d. Lower the fuel bundle into the nearest open reactor vessel location.

QUESTION: 075 (1.00)

PNPS Procedure No. 2.4.29, "Stuck Open Safety/Relief Valve," directs the operator to initiate a manual scram if a safety/relief valve cannot be closed properly. WHICH ONE of the following describes the reason for this requirement?

a. Rapid shutdown, cool down, and depressurization of the reactor minimizes coolant loss.

b. Technical Specification 3.6.D requires that the safety mode (self actuating relief mode) for all safety relief valves be operable.

c. Suppression pool temperature could increase and in turn cause a corresponding rise in drywell temperature and pressure which could possibly challenge containment.

d. Sustained pressure and flow will damage relief valve downstream piping.

QUESTION: 076 (1.00)

WHICH ONE of the following contains the parameters that would be used in determining if boron injection is required when using the BIIT curve?

a. RPV pressure, suppression pool temperature.

b. Reactor power, RPV pressure, suppression pool level.

c. Reactor power, suppression pool level, RPV pressure.

d. Suppression pool temperature, reactor power.

QUESTION: 077 (1.00)

EOP-2, "Failure to Scram," in step L-4 you are directed to section 'P' of the RPV level control flowpath if alternate RPV depressurization is required. Using the attached section 'P', WHICH ONE of the following describes the reason for entering section 'P'?

a. RPV level cannot be maintained greater than -155" with high pressure injection systems.

b. Prevents low pressure injection and dilution of the boron concentration that may have been injected into the reactor.

c. Prevents positive reactivity addition, as a result of the cooldown, which may cause a rapid increase in reactor power.

d. RPV level cannot be maintained greater than -125" using outside shroud injection systems.

QUESTION: 078 (1.00)

WHICH ONE of the following contains limits that are effected by suppression pool level?

a. Primary Containment Pressure Limit (PCPL).

b. Boron Injection Initiation Temperature Limit (BIIT).

c. Drywell Spray Initiation Limit (DSIL).

d. Torus to Reactor Building Vent Differential Pressure Limit (VDPL).

QUESTION: 079 (1.00)

WHICH ONE of the following is NOT an electrical load on the 125 VDC System?

a. Indicating lights for equipment on 4160 V busses.

b. Automatic Depressurization System solenoid operated valves.

c. Main Turbine control power.

d. Vital Services MG Set.

QUESTION: 080 (1.00)

Given that:

-the Unit is in single loop operation, due to a trip of a recirculation pump,

-the load line is 87%,

-the core flow is 30 Mlb/hr,

WHICH ONE of the following describes the appropriate operator action when LPRM downscale alarms start to cycle approximately every 2 to 3 seconds?

a. restart the tripped recirculation pump.

b. adjust recirculation flow on running loop.

c. scram the reactor.

d. bypass the Rod Worth Minimizer and insert each control rod in reverse sequence to Position 00.

QUESTION: 081 (1.00)

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 23" Hg vacuum which will cause a reactor scram.

b. The turbine will trip at 23" Hg vacuum resulting in a generator load reject and actuation of the select rod insert.

c. The turbine will trip before the reactor scrams at 23" Hg vacuum.

d. The turbine will trip after the reactor scrams at 23" Hg vacuum.

QUESTION: 082 (1.00)

EOP-03, "Primary Containment Control", contains an action statement that states "Maximize Drywell Cooling". WHICH ONE of the following actions would the NPRO be expected to take once he has received direction to maximize drywell cooling?

a. Initiate drywell spray.

b. Secure the recirculation pumps.

c. Locate and isolate the heat source.

d. Begin lowering the RBCCW system temperature.

QUESTION: 083 (1.00)

When performing EOP-03, "Primary Containment Control", the operator is asked to verify that plant parameters are in a region on the DSIL (Drywell Spray Initiation Limit) that will allow drywell spray. WHICH ONE of the following describes the consequences the DSIL protects against?

a. Thermal shock to containment structure.

b. Thermal shock to the reactor vessel and primary piping.

c. Overpressurizing the containment structure.

d. Exceeding the capability of the vacuum relief system.

QUESTION: 084 (1.00)

The reactor was manually scrammed due to a loss of TBCCW. WHICH ONE of the following states your immediate action(s) once you have determined TBCCW CAN NOT be restored?

a. Trip all the feedwater pumps.

b. Trip all cordensate pumps and VERIFY all the feedpumps have tripped.

c. Control reactor level in Single Element Control with one feedwater pump.

d. Control reactor level with the Start-up Control valve with one feedwater pump.

QUESTION: 085 (1.00)

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 Low.	C2 Right	A6
- Service Air Header Isolation.	C2 Right	A5
- Standby Compressor Running	C2 Right	C6

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.

QUESTION: 036 (1.00)

After months of full power operation the reactor has just scrammed and the plant parameters are as follows with the mode switch in "RUN":

- Reactor water level .....+52"
- Reactor pressure .....790 psig
- Drywell pressure .....2.2 psig
- HPCI equipment area temp. .....150 deg. F
- RCIC turbine compartment temp. ...150 deg. F
- RWCU area temp. .....150 deg. F
- Torus temp. .....82 deg. F
- Torus water level .....95"
- Drywell temp. .....185 deg. F

WHICH ONE of the following component or system actions should have occurred?

a. Drywell equipment drains close and the HPCI torus suction valves close.

b. The reactor building HVAC system isolates and the RCIC turbine steam inlet valves close.

c. LPCI injection valves interlocked closed and the RWCU system discharge isolation valves close.

d. The recirculation system sample valves closes and the main steam line drains isolate.

QUESTION: 087 (1.00)

During reactor operation, preferred AC power (offsite) is lost to all RBCCW pumps. WHICH of the following describes the effect of the power loss on the RBCCW system?

a. The operating pumps trip and must be manually restarted when offsite or emergency bus power is restored.

b. RBCCW pumps will sequence in each loop when the emergency bus is restored until 60 psig is achieved.

c. All RBCCW pumps will sequence on at 30 second intervals, when either offsite or emergency bus power is provided.

d. The operating RBCCW pumps will lockout and the standby pumps will sequence on at 30 second intervals when emergency bus power is provided.

QUESTION: 088 (1.00)

Following a loss of both CRD pumps, WHICH ONE of the following describes the plant response when the reactor is operating?

a. Control Rod HCUs may suddenly depressurize causing the scram function to become inoperable.

b. The recirculation pump Number 2 seals would increase in pressure.

c. The CRD flow control valve will close to try and maintain the desired flow rate.

d. Control Rod Drive Mechanisms will experience an increase in temperature.

QUESTION: 089 (1.00)

Given the following conditions:

- Drywell bulk temperature readings are 400 deg.F
- Reactor pressure is 200 psig
- RPV water level indication is +1 inches.

Using the attached "Caution #1, Figure #1", WHICH ONE of the following states the instrument(s), if any, that can be used to determine RPV water level?

a. Narrow range and Fuel Zone

b. FWLC range and Wide Range

c. Fuel Zone

d. No instruments can be used to determine RPV water level

QUESTION: 090 (1.00)

Concerning EOP-03, "Primary Containment Control", when performing the Primary Containment Pressure section, WHICH ONE of the following describes the significance of the torus water level (PC Water Level) being greater than 300 inches and below 77 feet?

a. Torus level has reached the point where drywell sprays have to be secured.

b. Torus level has reached a point where the vacuum breakers are starting to be submerged.

c. Torus level has reached a point where if drywell sprays are initiated containment failure or de-inertion may result.

d. Torus level has reached a point where containment venting will have to be through the drywell.

QUESTION: 091 (1.00)

WHICH ONE of the following describes the T/S basis for maintaining drywell temperatures below 215 deg. F?

a. To assure that containment integrity is maintained.

b. To assure that safety related equipment is not degraded by high temperature.

c. To assure that Alternate RPV Depressurization is not required.

d. To assure that RPV level instrument reference legs do not boil.

QUESTION: 092 (1.00)

Emergency Operating Procedure EOP-05, "Radioactivity Release Control", directs the operator to isolate certain primary systems, but gives exception to those systems required to shutdown the reactor. WHICH ONE of the following states the basis for this exception?

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.

[illegible] (1.00)

[illegible] a hot shutdown condition. Reactor recirculation pump "A" [illegible] pump suction and discharge valves are closed. WHICH ONE [illegible] describes the results from maintaining the seal purge flow [illegible] seals.

a. [illegible]urizat[illegible] of the pump casing.

b. [illegible]ermal damage to the seal elastomers.

c. [illegible]osion corrosion of the seals while they are not rotating.

d. Damage to control rod drive stub tubes from the cool purge water in the loop when the pump is restarted.

QUESTION: [illegible]4 (1.00)

The reacto[illegible] is shutdo[illegible] with the residual heat removal (RHR) shutdown cooling (SDC) mode providing core heat removal. The RHR experiences a system [illegible]olation. WHICH ONE of the following conditions caused the isolation?

a. Reactor pressure is 105 psig.

b. Reactor water level is +46 inches

c. Drywell temperature is 137 deg F.

d. Drywell pressure is 2.25 psig.

QUESTION: 095 (1.00)

While a primary system is discharging into the reactor building, EOP-04, Secondary Containment Control, directs the operator to enter and perform EOP-01, RPV Control, concurrently before the temperature in the secondary containment reaches maximum safe operating value in any area. EOP-01 directs a scram. WHICH ONE of the following states the basis for this scram?

a. Prevents failure of the secondary containment structure due to high pressure.

b. Allows personnel access to the reactor building before the temperature becomes too high.

c. Avoids the need for an emergency depressurization.

d. Reduces the energy that the RPV may be discharging into secondary containment to decay heat levels.

QUESTION: 096 (1.00)

Refueling operations are in progress. Technical specifications requires that during a spiral core loading the source range monitors (SRM) must be checked with an external source every 12 hours. WHICH ONE of the following states the MINIMUM criteria necessary for discontinuing the surveillance?

a. The surveillance may be stopped when at least one assembly with a minimum exposure of 800 MWD/ST is in the control cell.

b. The surveillance may be stopped when the SRM count rate is greater than counts per second.

c. The surveillance may be stopped when at least one assembly with a minimum exposure of 1000 MWD/ST is in the control cell.

d. The surveillance may be stopped when the SRM count rate is greater than 3 counts per second.

QUESTION: 097 (1.00)

If a jet pump failure is suspected, WHICH ONE of the following would be used in confirming a jet pump has failed?

a. Verifying riser delta pressure is greater than jet pump delta pressure.

b. Verifying riser delta pressure is lower than jet pump delta pressure.

c. Verifying jet pump delta pressure is higher than established jet pump delta pressure.

d. Verifying jet pump delta pressure is lower than established jet pump delta pressure.

QUESTION: 098 (1.00)

WHICH ONE of the following describes the effect on the Augmented Off Gas (AOG) System if TBCCW were lost during full power operations?

a. Possible loss of gland seal purge to AOG valves.

b. Loss of gland seal holdup line loop seal.

c. Loss of cooling to the inter and after condensers.

d. Possible increase in the AOG system moisture content.

QUESTION: 099 (1.00)

WHICH ONE of the following describes why reactor pressure vessel (RPV) level is lowered during an anticipated transient without a scram (ATWS)?

a. Lower level prevents temperature stratification and the resulting localized power peaks.

b. Lower level inhibits natural circulation and increases void fraction.

c. The lower head pressure allows more makeup flow from injecting systems.

d. The lower head pressure provides for more heat removal per pound mass of water vaporized increasing the rate of heat removal.

QUESTION: 100 (1.00)

WHICH ONE of the following states the design conditions for the emergency core cooling system (ECCS) performance?

a. Limit cladding temperatures to less than 2300 deg. F; limit local metal water reaction to 18%

b. Limit cladding temperatures to less than 2200 deg. F; limit core wide metal water reaction to 0.1%

c. Limit cladding temperatures to less than 1800 deg. F; limit core wide metal water reaction to 1%

d. Limit cladding temperatures to 2000 deg. F; limit local metal water reaction to 0.5%

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

ANSWER: 001 (1.00)

a. [+1.0]

REFERENCE:

1. Sys. Ref.: "Fuel Pool Cooling and Filtration System", pg FPC-1.

[2.9/3.2]

233000K306 ..(KA's)

ANSWER: 002 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS: Proc. No. 1.3.34, Rev 33, "Conduct of Operations"; pg 20 of 62.

[3.7/3.7]

294001K101 ..(KA's)

ANSWER: 003 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS: Proc. No. 1.3.34, Rev 33, "Conduct Of Operations", pg 12 of 62.

[3.3/4.2]

294001A109 ..(KA's)

ANSWER: 004 (1.00)

b. [+1.0]

REFERENCE:

1. IG: C-GT-02-02-06,"Emergency Preparedness", pg 552C/15; ELO 1.
[2.9/4.7]

294001A116 ..(KA's)

ANSWER: 005 (1.00)

b. [+1.0]

REFERENCE:

1. C-GT-02-03-02 Rev. 2, pg 675C/33; LO 2.
[2.7/3.7]

294001A103 ..(KA's)

ANSWER: 006 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Tagging Procedure PNPS 1.4.5, rev 34, pg 22 of 54.
[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 007 (1.00)

b. [+1.0]

REFERENCE:

1. C-GT-02-02-06 Rev. 0, pg 552C/16; LO 2.
[2.9/4.7]

294001A116 ..(KA's)

ANSWER: 008 (1.00)

b. [+1.0]

REFERENCE:

1. C-GT-02-03-04 Rev. 0, pg 556C/17; LO 4.

[3.3/3.6]

294001K104 ..(KA's)

ANSWER: 009 (1.00)

b. [+1.0]

REFERENCE:

1. C-GT-02-02-01 Rev. 0, pg 547C/12; LO 5.
[3.3/3.8]

294001K103 ..(KA's)

ANSWER: 010 (1.00)

a. [+1.0]

REFERENCE:

1. C-GT-02-01-03 Rev. 3, pg 539C/18; LO 6.

[3.2/3.7]

294001K105 ..(KA's)

ANSWER: 011 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.3.2, Rev. 15, "Special Fire Procedure Att. AA", pg 101 of 122

[3.5/3.8]

294001K116 ..(KA's)

ANSWER: 012 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.3.21, Rev. 10, "Bypassing Selected Interlocks", pg 4 of 54.

[3.5/4.2]

294001A112 ..(KA's)

ANSWER: 013 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.148 Rev. 5, "Abnormal Reactor Water Chemistry", pg 2 of 11.

[2.9/3.4]

294001A114 ..(KA's

ANSWER: 014 (1.00)

c. [+1.0]

REFERENCE:

1. I.G. 0-R0-03-04-02, "EOP Development and Use", pg IG-30

[3.8/4.1]

294001A102 ..(KA's)

ANSWER: 015 (1.00)

b. [+1.0]

REFERENCE:

1. HTFF chapter 9, obj 3, 4, 5

[3.1/3.6]

294001A108 ..(KA's)

ANSWER: 016 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Proc. No. 1.5.9.1, "Lifted Leads and Jumpers", pg 6 of 9.

[3.3/3.6]

294001K107 ..(KA's)

ANSWER: 017 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. No. 1.4.5, "PNPS Tagging Procedure", pg 14 of 54.

[3.9/4.5]

294001K102 ..(KA's)

ANSWER: 018 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. No. 1.4.36, Rev. 3, "High Pressure/Compressed Gas Cylinder Control", pg 8 of 10, step 9.

[3.4/3.8]

294001K109 ..(KA's)

ANSWER: 019 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-02, Rx Protection and ATWS Systems, pg IG-6; ELO 6.

[3.5/3.6]

201001K203 ..(KA's)

ANSWER: 020 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-02, Rx Protection and ATWS Systems, pg IG-? and IG-6; ELO 6 and ELO 11.

[3.5/3.6]

212000K106 ..(KA's)

ANSWER: 021 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System", pg and IG-23; ELO 24f.
2. Sys. Ref.: "Reactor Manual Control", pg RMC-5-5/89.

[3.5/3.5]

201002K403 ..(KA's)

ANSWER. 022 (1.00)

b. [+1.0]

REFERENCE:

1. Sys. Ref.: "Diesel Generators", pg DG-20 and DG-21.

[3.3/3.4]

264000K407 ..(KA's)

ANSWER: 023 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-03, "High Pressure Coolant Injection", pg IG-30-7/89; ELO 16f.
2. Sys. Ref.: "High Pressure Coolant Injection", pg HPCI-12-5/89.

[3.2/3.4]

206000K406 ..(KA's)

ANSWER: 024 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-01, "Non-Nuclear Instrumentation" , pg IG-23-4/89; ELO 10.
2. Sys. Ref.: "Non-Nuclear Instrumentation", pg NBI-3-4/89.

[3.4/3.3]

216000A101 ..(KA's)

ANSWER: 025 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-03, "High Pressure Coolant Injection", pg IG-27-7/89; ELO 8.
2. Sys. Ref.: "High Pressure Coolant Injection", pg HPCI-25-5/89.

[4.2/4.1]

206000K403 ..(KA's)

ANSWER: 026 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-03, "High Pressure Coolant Injection", pg IG-19-7/89 and IG-26-7; ELO 10 and 17.
2. Sys. Ref.: "High Pressure Coolant Injection", pg HPCI-35-5/89.

[3.9/4.0]

206000K402 ..(KA's)

ANSWER: 027 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-06, "Standby Liquid Control System", pg IG-6-6/89.

[4.1/4.1]

211000G004 ..(KA's)

ANSWER: 028 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-02, "Reactor Protection System and ATWS System", table 2 item 14; ELO 14.

[3.9/4.1]

212000K412 ..(KA 4)

ANSWER: 029 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-01, "Neutron Monitoring Systems", pg IG-4 and figure 10 Rev 1; ELO 8 and 11.

[3.1/3.2]

215004K602 ..(KA's)

ANSWER: 030 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-01, "Neutron Monitoring Systems", pg IG-4; ELO 10.

[3.4/3.4]

215004K102 ..(KA's)

ANSWER: 031 (1.00)

b. [+1.0]

deleted see facility comment's B

REFERENCE:

1. IG: 0-RO-02-09-04, "Reactor Core Isolation Cooling System", pg IG-7-7/89; ELO 12.

[3.8/3.7]

217000K007 ..(KA's)

ANSWER: 032 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-05, "Automatic Depressurization System", pg IG-1-7/89; ELO 1.

[4.0/4.1]

218000G004 ..(KA's)

ANSWER: 033 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-02, "Condensate and Feedwater System", pg IG-26; ELO 68.

[3.1/3.1]

259002K501 ..(KA's)

ANSWER: 034 (1.00)

b. [+1.0]

REFERENCE:

1. Sys. Ref.: "Diesel Generators", pg DGS-18. ELO-07

[3.6/3.6]

264000K602 ..(KA's)

ANSWER: 035 (1.00)

a. [+1.0]

REFERENCE:

1. Sys. Ref.: "Residual Heat Removal System", pg RHR-31 and figure "LPCI Loop Selection Logic" TP-20.
[4.0/4.0]

203000K411 ..(KA's)

ANSWER: 036 (1.00)

d. [+1.0]

REFERENCE:

1. Sys. Ref.: "Average Range Power Monitor", pg APRM-14-5/89.
2. PNPS Proc. No. 2.1.15 Rev 86 "Daily Log Test #22".

[3.0/3.4]

215005A107 ..(KA's)

ANSWER: 037 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-01, "Primary Containment System", pg IG-14-9/89; ELO 16.

   [3.1/3.3]

   223001K501 ..(KA's)

ANSWER: 038 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-01, "Pilary Containment System", pg IG-71-9/89; ELO 33.

   [3.5/3.5]

   223002A302 ..(KA's)

ANSWER: 039 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-05-01, "Main Turbine System", pg IG-16-5/89; ELO 72.

   [4.2/4.3]

   241000K302 ..(KA's)

ANSWER: 040 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-03, "Standby Gas Treatment System", ELO 7.
2. Station Question 68 57980/42

[2.7/2.7]

261000A409 ..(KA's)

ANSWER: 041 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-02, "Core Spray System", ELO 12.
2. Sys. Ref.: "Core Spray System"

[3.2/3.4]

209001K401 ..(KA's)

ANSWER: 042 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System", pg IG-35; ELO 31.

[3.4/3.5]

201006K404 ..(KA's)

ANSWER: 043 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System", pg IG-29; ELO 19c.

[3.7/3.9]

202001K306 ..(KA's)

ANSWER: 044 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-05, "Reactor Water Cleanup System", pg IG-3-7; EL 8.

[3.5/3.6]

204000K404 ..(KA's)

ANSWER: 045 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-09-01, "LPCI and RHR System", pg IG-7; ELO 14.
2. Sys. Ref. "Primary Containment Isolation System", pg PCIS-16-6/89.

[3.7/3.8]

205000K402 ..(KA's)

ANSWER: 046 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-04, "Rod Position And Information System", pg IG-4-6/89; ELO 11.

[3.2/3.2]

1000K104 ..(KA's)

ANSWER: 047 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System", pg TP-23-8/89.
2. Sy f.: "Rod Block Monitor System", pg RBM-9.

[3.4/3.5]

215002K401 ..(KA's)

ANSWER: 048 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-01-03, "Main Generator", pg IG-19-4/89; ELO 6 and 7.
2. Sys. Ref.: "Main Generator", pg MG-20 and MG-22.

[3.1/2.9]

245000A402 ..(KA's)

ANSWER: 049 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-03, "Main Condenser Vacuum and Augmented Off Gas System", pg IG-14-5/89; ELO 2.

[3.1/3.6]

271000K111 .(KA's)

ANSWER: 050 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-01-01, "DC Electrical Distribution System", pg IG-12-4/89; ELO 7 and 8.

[3.1/3.4]

263000K201 ..(KA's)

ANSWER: 051 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-05, "Plant Ventilation Systems", pg IG-9-7/90; ELO 7.

   [2.9/3.0]

   290003K107 ..(KA's)

ANSWER: 052 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-05, "Plan Ventilation Systems", pg IG-4-7/90 and IG-13-7/90; ELO 12

   [3.8/3.8]

   288000A3G1 ..(KA's)

ANSWER: 053 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-01, "Neutron Monitoring Systems", pg IG-17; ELO 44

   [3.4/3.7]

   215001A207 ..(KA's)

ANSWER: 054 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-01, "Neutron Monitoring Systems", pg IG-18; ELO 42

   [3.3/3.4]

   215001K105 ..(KA's)

ANSWER: 055 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-02, "Condensate and Feedwater System", pg IG-41; ELO 33.

   [3.4/3.4]

   295008A202 ..(KA's)

ANSWER: 056 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-04-02, "Condensate and Feedwater System", pg IG-41; ELO 81.

   [3.9/3.9]

   295009K202 ..(KA's)

ANSWER: 057 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-05, "Primary Containment Control", pg IG-29; ELO 11.

[3.3/3.5]

295010K202 ..(KA's)

ANSWER: 058 (1.00)

d. [+1.0]

REFERENCE:

1. Instructor Guides for EOP-01, EOP-02 and EOP-03; entry conditions.

[4.2/4.5]

295010G011 ..(KA's)

ANSWER: 059 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.20, Rev. 11, "Immediate Operator Actions", pg 2 of 5.

[3.6/3.8]

295014A102 ..(KA's)

ANSWER: 060 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System", pg IG-22; ELO 18 and ELO 23.
2. PNPS Proc. No. 2.1.1, Rev. 68, "Startup from Shutdown", pg 10 of 94.

[3.6/3.7]

295014K211 ..(KA's)

ANSWER: 061 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.3.23, Rev. 8, "Alternate Rod Insertion", pg 6,7,8 and 9 of 15.

[3.8/3.9]

295015A101 ..(KA's)

ANSWER: 062 (1.00)

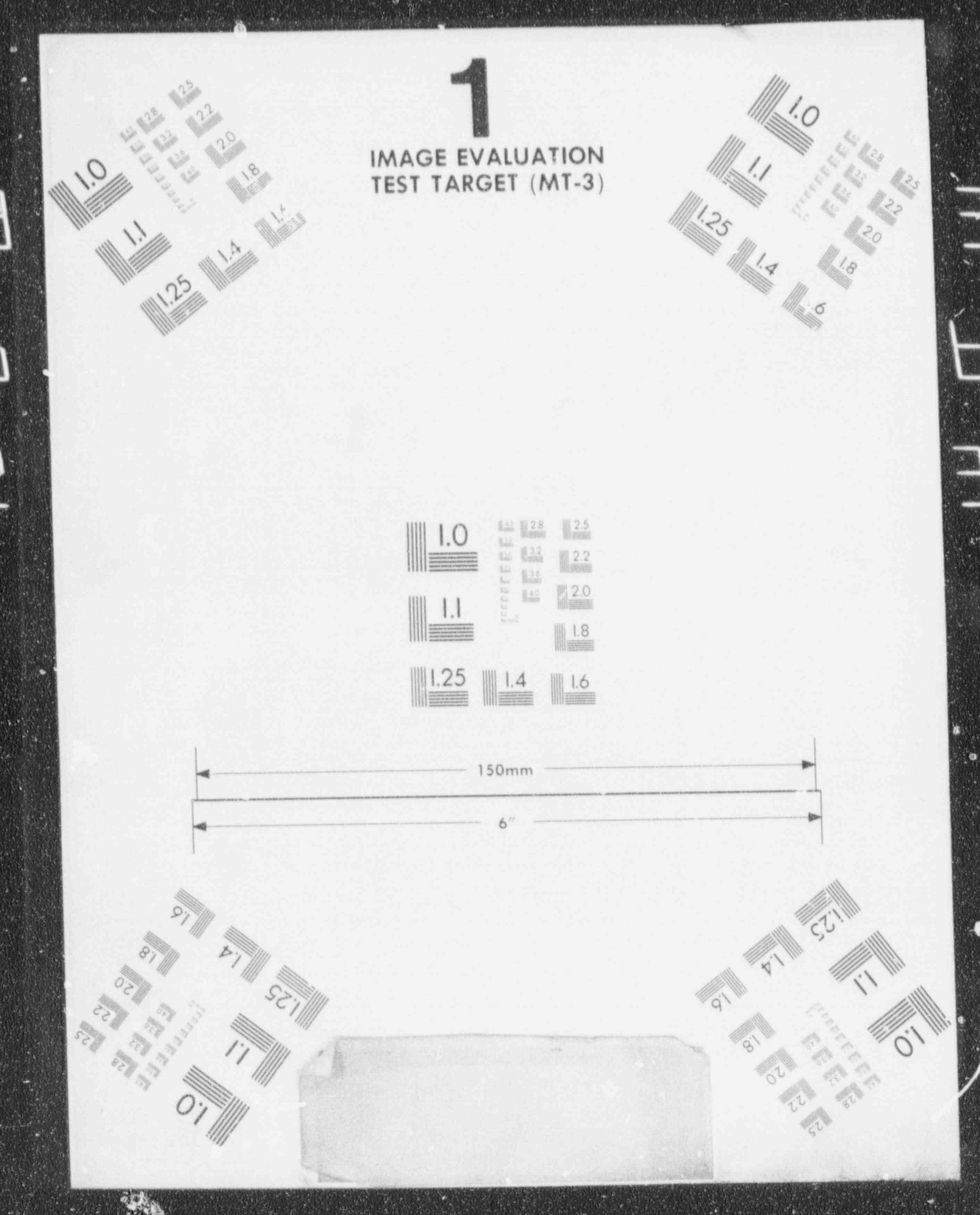
b. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System", pg IG-25; ELO 19f and ELO 35.
2. IG: 0-RO-02-07-02, "RPS and ATWS System", pg IG-14; ELO 30.

[4.1/4.2]

295037K210 ..(KA's)


1
IMAGE EVALUATION
TEST TARGET (MT-3)
1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
150mm
6"

ANSWER: 063 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-07-02, "PPS and ATWS System", pg IG-15 and IG-26; ELO 30.

[4.1/4.2]

293037K203 ..(KA's)

ANSWER: 064 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-05, "Primary Containment Control (EOP-3)", pg IG-32 and IG-33; ELO 11.

[4.1/4.2]

295024K101 ..(KA's)

ANSWER: 065 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RC-02-09-04, "Reactor Core Isolation Cooling System"; ELO 14.

[4.0/4.3]

295014A203 ..(KA's)

deleted per facility comment B

ANSWER: 066 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-06, "Standby Liquid Control", pg IG-1-6/89; ELO 1.

[4.3/4.4]

211000K301 ..(KA's)

ANSWER: 067 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.3.6, Rev. 11, "Loss of Vital AC (Y-2)", pg 2 of 5.
2. IG: 0-RO-02-01-02, "AC Electrical Distribution"; ELO 35b.

[4.2/4.3]

295003A202 ..(KA's)

ANSWER: 068 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-05, "EOP-03 Primary Containment Control"; ELO 2.

[4.1/4.4]

295013G011 ..(KA's)

ANSWER: 069 (1.00)

b. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-05, "EOP-03 Primary Containment Control"; pg IG-11.
2. IG: 0-RO-03-04-03, "EOP-01 RPV Control"; ELO 1a.

[3.3/3.5]

295013G007 ..(KA's)

ANSWER: 070 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.143, Rev. 10, "Shutdown from Outside the Control Room", pg 25 of 81.

[3.5/3.6]

218000G010 ..(KA's)

ANSWER: 071 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.143, Rev. 10, "Shutdown from Outside the Control Room", pg 5 of 81.

[4.0/4.1]

295016K202 ..(KA's)

ANSWER: 072 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.143, Rev. 10, "Shutdown from Outside the Control Room", pg 5 of 81.

[4.0/4.1]

295016A106 ..(KA's)

ANSWER: 073 (1.00)

b. [+1.0]

REFERENCE:

1. PNPS Proc. No. 4.3, Rev. 52, "Fuel Handling", pg 6, 7 & 8 of 36.

[3.3/3.7]

295023K201 ..(KA's)

ANSWER: 074 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.4.3, Rev. 10, "Refuel Floor High Rad", pg 2 of 4.

[3.8/3.9]

295023G010 ..(KA's)

ANSWER: 075 (1.00)

c. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.29, Rev. 12, "Stuck Open Safety/Relief Valve", pg 4 of 12.

[3.9/4.1]

295026K304 ..(KA's)

ANSWER: 076 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-04, "EOP-02 Failure to Scram"; pg IG-44; ELO 19.

[4.1/4.2]

295026A201 ..(KA's)

ANSWER: 077 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-04, "EOP-02 Failure to Scram"; pg IG-8.
2. EOP-02 flowchart
[3.8/3.9]

295007K103 ..(KA's)

ANSWER: 078 (1.00)

a. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-02, "EOP Development and Use"; pg IG-56 through IG-70.

   [3.8/4.1]

   295030K103 ..(KA's)

ANSWER: 079 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-03-01-01, "DC Electrical Dirtribution System", pg IG-11-4/89 through IG-13-4/89; ELO 7.

   [3.5/3.9]

   295004A202 ..(KA's)

ANSWER: 080 (1.00)

c. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-02, "Recirculation System"; ELO 17.
2. Sys. Ref.: "Reactor Recirculation System", pg RR-34.
3. PNPS Proc. No. 2.4.17, Rev. 13, "Recirculation Pump(s) Trip"; pg 4 of 8.

[3.4/3.6]

295001K304 ..(KA's)

ANSWER: 081 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-05-01, "Main Turbine System", pg IG-33-5/89; ELO 29.
2. IG: 0-RO-02-07-02, "RPS and ATWS System", pg IG-13; ELO 14.

[3.6/3.8]

295002K103 ..(KA's)

ANSWER: 082 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-05, "Primary Containment Control", pg IG-5; ELO 14.

[3.3/3.6]

295011G007 ..(KA's)

ANSWER: 083 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-05, "Primary Containment Control", pg IG-7; ELO 7. [3.3/3.5]

295012G007 ..(KA's)

ANSWER: 084 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS Proc. No. 2.4.41, Rev. 14, "Loss of TBCCW", pg 3 of 7. [3.4/3.7]

295018G010 ..(KA's)

ANSWER: 085 (1.00)

b. [+1.0]

REFERENCE:

1. PNPS Proc. No. 5.3.8, Rev. 15, "Loss of Instrument Air", pg 2 of 9
2. IG: 0-RO-02-02-04, "Instrument and High Pressure Air"; ELO 7. [3.5/3.6]

295019A201 ..(KA's)

ANSWER: 086 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-08-01, "Primary Containment System", pg IG-18-9/89 through IG-33-89/89; ELO 34.

[3.6/3.6]

295020A101 ..(KA's)

ANSWER: 087 (1.00)

b. [+1.0]

REFERENCE:

1. System Reference Text, Book 3 RB3-4/89

[3.3/3.5]

295012K101 ..(KA's)

ANSWER: 088 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-02-06-03, "Control Rod Drive System"; ELO 15 and 9.
2. PNPS Proc. No. 2.4.4, Rev. 9, "Loss of CRD Pumps", pg of 5.

[3.1/3.1]

295022K202 ..(KA's)

ANSWER: 089 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-02, "EOP Development and Use"; ELO 21.
2. Question is from the previous exam.

[3.4/3.3]

216000A101 ..(KA's)

ANSWER: 090 (1.00)

d. [+1.0]

REFERENCE:

1. IG: 0-RO-03-04-05, "EOP-03, Primary Containment Control", pg IG-32; ELO 17.

[2.6/2.9]

295029K208 ..(KA's)

ANSWER: 091 (1.00)

b. [+1.0]

REFERENCE:

1. PNPS: Technical Specifications 3.2 Bases, page 73b, Rev. 109.
2. PNPS: LP, O-RO-02-08-04, Primary Containment Cooling, IG-6-8/89, ELO 2 & 13.

[3.1/4.1]

295011G004 ..(KA's)

ANSWER: 092 (1.00)

d. [+1.0]

REFERENCE:

1. IG: RO-03-04-07," EOP-05 Radioactivity Release Control", pg; IG-3; ELO-02.

   [3.6/3.9]

295017K301 ..(KA's)

ANSWER: 093 (1.00)

a. [+1.0]

REFERENCE:

1. PNPS: Proc. 2.2.84 Reactor Recirc., Rev. 35, pg. 35.

   [3.2/3.4]

295018G007 ..(KA's)

ANSWER: 094 (1.00)

a. [+1.0]

REFERENCE:

1. IG: RO-02-08-01,"Primary Containment System", pg; IG-28-9/89; ELO-33.

   [3.2/3.3]

295021A206 ..(Y s)

ANSWER: 095 (1.00)

d. [+1.0]

REFERENCE:

1. IG: RO-03-04-06,"EOP-04 Secondary Containment Control", pg IG-9; ELO-02.

[3.6/3.8]

295032K302 ..(KA's)

ANSWER: 096 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS: TS 3.10 Core Monitoring Bases, Rev 152. p.204A.
2. Proc. No. 4.3 "Fuel Handling", Rev. 52, pg. 5 and 23 of 36. [2.9/3.6]

295023G007 ..(KA's)

ANSWER: 097 (1.00)

d. [+1.0]

REFERENCE:

1. PNPS: TS & Bases 3.6.E, pp. 127, 147 & 147a.

[3.5/4.2]

295001G008 ..(KA's)

ANSWER: 098 (1.00)

d. [+1.0]

REFERENCE:

1. IG: RO-02-04-03,"Main Condenser Vacuum and Augmented Off Gas System", pg IG-24-5/89; ELO 9b.

   [3.4/3.6]

295016K202 ..(KA's)

ANSWER: 099 (1.00)

b. [+1.0]

REFERENCE:

1. This question came from the previous exam. The reference given then was: Sim. LP IM EOP-2 Failure to Scram, p.IG-8-5/89. None of the reference material sent for this exam directly addresses this question.

   [4.1/4.5]

295037K303 ..(KA's)

ANSWER: 100 (1.00)

b. [+1.0]

REFERENCE:

1. PNPS: TS Bases 3.5.A Core Spray and LPCI Subsystems, Rev. 148, p. 113.

   [3.0/4.3]

295031G004 ..(KA's)

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

S R O E x a m B W R R e a c t o r

O r g a n i z e d b y Q u e s t i o n N u m b e r

QUESTION	VALUE	REFERENCE
001	1.00	14073
002	1.00	9000001
003	1.00	9000002
004	1.00	9000003
005	1.00	9000004
006	1.00	9000005
007	1.00	9000006
008	1.00	9000007
009	1.00	9000008
010	1.00	9000009
011	1.00	9000010
012	1.00	9000011
013	1.00	9000012
014	1.00	9000013
015	1.00	9000014
016	1.00	9000015
017	1.00	9000016
018	1.00	9000017
019	1.00	9000018
020	1.00	9000019
021	1.00	9000020
022	1.00	9000021
023	1.00	9000022
024	1.00	9000023
025	1.00	9000024
026	1.00	9000025
027	1.00	9000026
028	1.00	9000027
029	1.00	9000028
030	1.00	9000029
031	1.00	9000030
032	1.00	9000031
033	1.00	9000033
034	1.00	9000034
035	1.00	9000035
036	1.00	9000036
037	1.00	9000037
038	1.00	9000038
039	1.00	9000039
040	1.00	9000040
041	1.00	9000042
042	1.00	9000047
043	1.00	9000048
044	1.00	9000049
045	1.00	9000050
046	1.00	9000051
047	1.00	9000052
048	1.00	9000053
049	1.00	9000054

S R O E x a m B W R R e a c t o r

O r g a n i z e d b y Q u e s t i o n N u m b e r

QUESTION	VALUE	REFERENCE
050	1.00	9000059
051	1.00	9000061
052	1.00	9000065
053	1.00	9000066
054	1.00	9000067
055	1.00	9000072
056	1.00	9000073
057	1.00	9000074
058	1.00	9000075
059	1.00	9000076
060	1.00	9000077
061	1.00	9000078
062	1.00	9000079
063	1.00	9000080
064	1.00	9000081
065	1.00	9000082
066	1.00	9000083
067	1.00	9000084
068	1.00	9000085
069	1.00	9000086
070	1.00	9000087
071	1.00	9000088
072	1.00	9000089
073	1.00	9000090
074	1.00	9000091
075	1.00	9000092
076	1.00	9000093
077	1.00	9000094
078	1.00	9000095
079	1.00	9000096
080	1.00	9000097
081	1.00	9000098
082	1.00	9000099
083	1.00	9000100
084	1.00	9000101
085	1.00	9000102
086	1.00	9000103
087	1.00	9000104
088	1.00	9000105
089	1.00	9000106
090	1.00	9000107
091	1.00	9000108
092	1.00	9000110
093	1.00	9000112
094	1.00	9000113
095	1.00	9000115
096	1.00	9000116
097	1.00	9000117
098	1.00	9000118

S R O E x a m B W R R e a c t o r

O r g a n i z e d b y Q u e s t i o n N u m b e r

QUESTION	VALUE	REFERENCE
099	1.00	9000124
100	1.00	9000125
	100.00	
	100.00	

SRO Exam BWR Reactor

Organized by KA Group

PLANT WIDE GENERICS

QUESTION	VALUE	KA
014	1.00	294001A102
005	1.00	294001A103
015	1.00	294001A108
003	1.00	294001A109
012	1.00	294001A112
013	1.00	294001A114
004	1.00	294001A116
007	1.00	294001A116
002	1.00	294001K101
006	1.00	294001K102
017	1.00	294001K102
009	1.00	294001K103
008	1.00	294001K104
010	1.00	294001K105
016	1.00	294001K107
018	1.00	294001K109
011	1.00	294001K116
PWG Total	17.00	

PLANT SYSTEMS

Group I

QUESTION	VALUE	KA
035	1.00	203000K411
026	1.00	206000K402
025	1.00	206000K403
023	1.00	206000K406
041	1.00	209001K401
027	1.00	211000G004
066	1.00	211000K301
020	1.00	212000K106
028	1.00	212000K412
030	1.00	215004K102
029	1.00	215004K602
036	1.00	215005A107
089	1.00	216000A101
024	1.00	216000A101
031	1.00	217000G007
032	1.00	218000G004
070	1.00	218000G010
037	1.00	223001K501
038	1.00	223002A302
039	1.00	241000K302

S R O E x a m B W R R e a c t o r

O r g a n i z e d b y K A G r o u p

PLANT SYSTEMS

Group I

QUESTION	VALUE	KA
033	1.00	259002K501
040	1.00	261000A409
022	1.00	264000K407
034	1.00	264000K602
PS-I Total	24.00	

Group II

QUESTION	VALUE	KA
019	1.00	201001K203
021	1.00	201002K402
042	1.00	201006K404
043	1.00	202001K306
044	1.00	204000K404
045	1.00	205000K402
046	1.00	214000K104
047	1.00	215002K401
048	1.00	245000A402
050	1.00	263000K201
049	1.00	271000K111
051	1.00	290003K107
PS-II Total	12.00	

Group III

QUESTION	VALUE	KA
053	1.00	215001A207
054	1.00	215001K105
001	1.00	233000K306
052	1.00	288000A301
PS-III Total	4.00	
PS Total	40.00	

EMERGENCY PLANT EVOLUTIONS

Group I

S R O E x a m B W R R e a c t o r

O r g a n i z e d b y K A G r o u p

EMERGENCY PLANT EVOLUTIONS

Group I

QUESTION	VALUE	KA
067	1.00	295003A202
077	1.00	295007K103
056	1.00	295009K202
058	1.00	295010G011
057	1.00	295010K202
069	1.00	295013G007
068	1.00	295013G011
059	1.00	295014A102
065	1.00	295014A203
060	1.00	295014K211
061	1.00	295015A101
072	1.00	295016A106
071	1.00	295016K202
092	1.00	295017K301
096	1.00	295023G007
074	1.00	295023G010
073	1.00	295023K201
064	1.00	295024K101
076	1.00	295026A201
075	1.00	295026K304
078	1.00	295030K103
100	1.00	295031G004
063	1.00	295037K203
062	1.00	295037K210
099	1.00	295037K303
EPE-I Total	25.00	

Group II

QUESTION	VALUE	KA
097	1.00	295001G008
080	1.00	295001K304
081	1.00	295002K103
079	1.00	295004A202
055	1.00	295008A202
091	1.00	295011G004
082	1.00	295011G007
083	1.00	295012G007
087	1.00	295012K101
093	1.00	295018G007
084	1.00	295018G010
098	1.00	295018K202
085	1.00	295019A201

S R O E x a m B W R R e a c t o r

O r g a n i z e d b y K A G r o u p

EMERGENCY PLANT EVOLUTIONS

Group II

QUESTION	VALUE	KA
086	1.00	295020A101
094	1.00	295021A206
088	1.00	295022K202
090	1.00	295029K208
095	1.00	295032K302
EPE-II Total	18.00	
EPE Total	43.00	
Test Total	100.00	

Attachment 3

Facility Comments and NRC Response

NRC Response to Facility Comments

Facility Comment: RO Question: 28 / SRO Question: 31

We recommend that this question be deleted from the examination. The PNPS RCIC System does not have controls as described in the question. The reference material stated concerns the RCIC steam line containment isolation valves and are not associated with RCIC turbine reset.

NRC Response: Comment accepted. Answer key will be changed accordingly.

Facility Comment: RO Question: 99

We recommend that the correct response be changed to answer (b). When the HPCI System controller is operated in the "manual" mode a constant speed signal is sent to the speed reference section. Since the HPCI turbine/pump speed will remain constant regardless of steam supply pressure, and the HPCI System is aligned in the "full flow test" mode, pump pressure and flow will remain constant.

NRC Response: Comment Accepted. Answer key will be changed accordingly.

Facility Comment: SRO Question: 66

We recommend that this question be deleted from the examination. The PNPS definition for "Hot Shutdown Boron Weight" (HSBW) does not match any of the provided responses. Each of the Provided choices are either wholly incorrect or have at least a fifty percent inaccuracy. Based on this, there is no clear choice.

NRC Response: Comment Accepted. Answer key will be changed accordingly.

NRC Comment: RO Question: 33 / SRO Question: 35

The valve indicated in all distractors is incorrect. This correction was made by the NRC during the test.

NRC Comment: RO Question: 39

Distractors (c) and (d) were incomplete. This correction was made by the NRC during the test.

QUESTION: 028 (1.00 Points)

WHICH ONE of the following Reactor Core Isolation Cooling (RCIC) trips/ isolations can be reset inside the control room when the RCIC Turbine Reset Button is depressed?

a. Turbine overspeed.

b. Low pump suction pressure.

c. High reactor vessel level.

d. Low turbine RPM.

ANSWER:

b.

COMMENTS:

We recommend that this question (#28) be deleted from the examination. The PNPS RCIC System does not have controls as described in the question. The reference material stated concerns the RCIC steam line containment isolation valves and are not associated with RCIC turbine reset.

REFERENCES:

- PNPS RCIC Instructor Guide, O-RO-02-09-04, Page IG-7-7/89.
- PNPS RCIC System Description, RCIC System, Control Room Controls, Pages RCIC 14, 15, 16, 17.
- PNPS Procedure 2.2.22, RCIC System, Pages 10 and 17 of 54 (Rev. 37).

59600/31

QUESTION: 031 (1.00 Points)

WHICH ONE of the following Reactor Core Isolation Cooling (RCIC) trips/isolations can be reset inside the control room when the RCIC Turbine Reset Button is depressed?

a. Turbine overspeed.

b. Low pump suction pressure.

c. High reactor vessel level.

d. Low turbine RPM.

ANSWER:

b.

COMMENTS:

We recommend that this question (#31) be deleted from the examination. The PNPS RCIC System does not have controls as described in the question. The reference material stated concerns the RCIC steam line containment isolation valves and are not associated with RCIC turbine reset.

REFERENCES

- PNPS RCIC Instructor Guide, O-RO-02-09-04, Page IG-7-7/89.
- PNPS RCIC System Description, RCIC System, Control Room Controls, Pages RCIC-14, 15, 16, 17
- PNPS Procedure 2.2.22, RCIC System, Pages 10 and 17 of 54 (Rev. 37)

	Allows draining vacuum tank condensate to Reactor Building Equipment sump.	State valve purpose.
(ELO 2)	Opened by vacuum tank high level, and interlocked closed by full open signal from steam supply valve.	Discuss valve interlock.
(ELO 4)	Control switch on panel 904.	Give control switch location.
	17. Steam supply line isolation valves (MO-1301-16 & 17)	
	Normally open, motor operated 1301-16 has throttle capability, 2/3 Hp, power from 480 V load center B-8. 1301-17 is 1/3 Hp, power from 125 VDC panel D-7.	Describe valve operator, give power supply.
(ELO 7)	Isolate steam to the RCIC turbine.	State valve purpose.
(ELO 12)	Closed by isolation signal until reset pushbutton depressed, and isolation signal clear.	Discuss valve interlocks.
	Opened by RCIC system initiation unless isolation signal present.	
(ELO 4)	Control switch on panel 904	Give control switch location.
	18. Test bypass valve to CST (MO-1301-53)	
	Normally closed, 1-4/5 Hp motor operated, power from 125 VDC D-7.	Describe valve operator, give power supply.
(ELO 7)	Allows RCIC full flow testing.	State valve purpose.
(ELO 12)	Closed by initiation signal, 1301-25(26) fully open, or by control switch on panel 904.	Discuss valve interlocks.
(ELO 4)	Opened by control switch on panel 904. Can be used as a throttling valve during RCIC testing.	Give control switch location. Discuss throttling compatibility.
	19. Check valve	
(ELO 4)	Indication on panel 904.	Give valve position indication location.

III. System Operations

NOTE: This section outlines the major steps performed during system operations and is not intended to be substituted for plant procedures.

Interlock and Trips	Functions
Turbine trip and panel 904 alarm annunciation	The following will cause the RCIC turbine to trip: RCIC system automatic isolation, pump low suction pressure (15" Hg), high turbine exhaust pressure (46 psig), manual pushbutton, overspeed (125 percent rated speed).
Steam-to-turbine supply valve (MO-1301-61) closure	Valve automatically closes on high (+48") reactor water level. Valve automatically reopens on low-low (-49") reactor water level.
Steam isolation valves (MO-1301-16 and -17) close and panel 904 alarm annunciation	The following will cause a RCIC system isolation: RCIC steam line high flow (300% for 3 sec.), low reactor pressure (50 psig) or RCIC area high temperature: RCIC turbine room (160-170°F), RCIC valve station (190-200°F), torus compartment (140-150°F). A white light above the auto isolation channel A(B) illuminates to indicate an isolation signal.
MO-1301-25, 26 open fully	CST suction valve (MO-1301-22) shuts. Full flow test valve (MO-1301-53) interlock closed.
Drain pot high level	Steam trap bypass valve (CV-1301-32) opens to allow full flow to main condenser.
High vacuum tank level	Opens CV-1301-12, 13 to drain tank. Valves do not open if RCIC is operating.

5. Control Room Controls

Item/Location	Functions of Positions	
Overspeed test potentiometer Panel 904 1340-014	(VARIABLE)	Operated with speed test switch to control RCIC turbine speed during test operations.
Turbine test power switch 13A-S22 on panel 904	ON	Energizes RCIC testing power supply to the overspeed test potentiometer
	OFF	De-energizes RCIC testing power supply to the overspeed test potentiometer
Turbine test switch 13A-S20 on panel 904	NORMAL	Removes the test potentiometer from the RCIC turbine control circuit

Item/Location	Functions of Positions	
	TURB TEST	Places the test potentiometer in the RCIC turbine control circuit and removes the flow controller. Initiates turbine test alarm. This switch is automatically removed from the control circuit on RCIC system initiation.
Turbine trip switch 13A-S17 on panel 904	PUSH PUTTON	Initiates a RCIC turbine trip
Steam drain valves (AO-34 and -35) 13A-S11 on panel 904	OPEN	Opens valves unless interlock closes them
	CLOSE	Closes valves
Condensate pump isolation valves (AO-12 and -13) 13A-S12 on panel 904	OPEN	Opens valves
	CLOSE	Closes valves unless interlock opens them
Steam supply valve (MO-16) 13A-S1 on panel 904 (jog)	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation, and trip signals
	CLOSE	Closes valve
Steam supply valve (MO-17) 13A-S3 on panel 904	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve
Auto isolation channel A reset on panel 904	PUSH BUTTON	Resets automatic isolation circuitry logic channel A
Auto isolation channel B reset on panel 904	PUSH BUTTON	Resets automatic isolation circuitry logic channel B
Condenser drain valve (AO-32) 13A-S13 on panel 904	OPEN	Opens valve
	CLOSE	Closes valve (opened by interlock)
Pump suction from CST (MO-22) 13A-S4 on panel 904	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve

Item/Location	Functions of Positions	
Pump suction from torus (MO-25) 13A-S10 on panel 904	OPEN	Opens valve
	NORM	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve
Pump suction from torus (MO-26) 13A-S9 on panel 904	OPEN	Opens valve
	NORM	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve
Test bypass to cond. tank (MO-53) 13A-S7 on panel 904 (jog)	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve
Initiation signal reset switch Panel 904 Panel 904	PUSH BUTTON	Resets sealed in system initiation if initiation signal has cleared.
Minimum flow bypass valve (MO-60) 13A-S21 on panel 904	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve
Injection valve (MO-49) 13A-S5 on panel 904	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve
Pump discharge valve (MO-48) 13A-S6 on panel 904	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve
Steam inlet valve (MO-61) 13A-S2 on panel 904	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation, and trip signals.
	CLOSE	Closes valve

Item/Location	Functions of Positions	
Turbine cooling water valve (MO-62) 13A-S8 on panel 904	OPEN	Opens valve
	AUTO	Valve operates by interlock, initiation and trip signals.
	CLOSE	Closes valve
Bar condenser vacuum pump 13A-S15 on panel 904		Prevents inadvertent pump starting
	STOP	Stops pump
	AUTO	Pump starts on a system initiation signal
	START	Starts pump
Bar condenser condensate pump 13A-S14 on panel 904	PTL	Prevents inadvertent pump starting
	STOP	Stops pump
	AUTO	Pump starts on high barometric condenser level
	START	Starts pump

6. Local Controls

Item	Functions	
Trip-throttle valve trip lever	ENGAGED	Resets mechanical overspeed trip
	DIS-ENGAGED	Trips turbine
Trip-throttle valve operator	HANDWHEEL	Locally controls throttle valve
Bar. conden[illegible] cond. pump	PUSHBUTTON	Can be used to start the pump regardless of any remote switch position. Can be used to stop the pump, but will not override an auto start on high vacuum tank level if the control room switch is in AUTO.

4.3 INTERLOCKS (Continued)

[9] If MO-1301-25 or MO-1301-26, TORUS SUCT VLVs, are open, MO-1301-53, RCIC FULL FLOW TEST VLV, will close if open.

4.4 TURBINE CONTROL

During standby conditions, MO-1301-61, TURBINE SUPPLY VLV, is closed, the Trip and Throttle (T & T) valve is open, and the governor valve is open. On low reactor water level, MO-1301-61 will automatically open to start the turbine. The turbine is shutdown on reactor high water level by the automatic closure of steam supply, MO-1301-61. Thus, the manually operated Trip and Throttle valve remains open during the high level trip operation and the system is allowed to restart automatically upon receipt of a reactor low low water level signal.

The Trip and Throttle valve is tripped closed by:

[1] An overspeed trip, or

[2] Turbine electrical trip signals (refer to Step 4.2[6]).

The overspeed trip is completely mechanical. The turbine electrical trip signals act through an electrical trip solenoid (ETS). Both the overspeed trip and the ETS close the Trip and Throttle Valve which must be reset manually.

The Governor Valve controls turbine speed by throttling the turbine inlet steam flow. The valve is positioned by means of a hydraulic actuator mounted on the valve. The control signals for the valve originate in the Main Control Room from either the flow controller or the test power supply. The flow controller can be operated manually or in the automatic mode. For auto system initiation, the flow controller must be in automatic. In this mode the flow controller adjusts the turbine speed, by means of the Governor Valve, to obtain the required pump output flow. The Governor Valve, and thus turbine speed, can be controlled manually by using the flow controller in manual or by using the test power supply with its associated potentiometer. During auto system initiation, the test power supply is automatically bypassed and the turbine speed controlled from the flow controller regardless of the position of the "turbine test" selector switch.

The control circuitry for the RCIC System is 115VAC supplied by an inverter from the 125VDC Bus "A". A high voltage input condition (approximately 160VDC) will trip the inverter. The unit will automatically reset after the input voltage conditions return to normal with an approximate 3 second time delay. The loss of the 115VAC to the control circuitry will cause a reduction in the flow demand signal to the turbine for a short time. The auto-reset of the inverter will result in the RCIC System returning to rated flow without operator action. For a rapid (less than 5 seconds) DC transient, the inverter auto reset feature will allow the system to remain at rated flow. If DC was gone for an extended period, the turbine would have tripped on overspeed and will remain tripped.

7.3.2 Operator Actions

[1] CLOSE MO-1301-49, INJ VLV #2.

[2] CLOSE OR VERIFY CLOSED MO-1301-61, TURBINE SUPPLY VLV.

[3] RETURN the system to the normal STANDBY condition by performing Section 7.1

[4] RESET the Trip and Throttle (T&T) Valve (labeled as "STOP VALVE") as follows (if required):

(a) VERIFY the overspeed ball and tappet is fully down and lined up with the emergency head lever. If the alignment is not as above, THEN ISSUE an F&MR.

(b) ENGAGE the overspeed ball and tappet nut by lining up the hand trip lever and the emergency head lever.

(c) ROTATE handwheel clockwise until sliding nut and latch lever can be engaged by the trip hook.

(d) RESET the mechanical overspeed trip by pushing the connecting linkage between the T & T Valve and overspeed trip mechanism to the left until the manual trip lever on the overspeed unit is reset and holds linkage in reset position.

(e) With the trip hook on T & T Valve engaged with latch lever, ROTATE handwheel counterclockwise until the spindle coupling contacts the bottom of the sliding nut, indicating valve wide open.

(f) TURN handwheel 1/4 turn clockwise to allow clearance for thermal expansion.

(g) The trip hook is held engaged with the latch lever by a spring.

(h) Electrical tripping is accomplished by energizing the electrical trip solenoid.

[5] USE Attachment 7 to reopen MO-1301-16 and MO-1301-17.

QUESTION: 099 (1.00 Points)

Given the following conditions:

- High pressure coolant injection (HPCI) is operating
- The flow test valve is throttled open
- The HPCI flow controller is in MANUAL
- The injection valve is closed
- The minimum flow valve is closed

WHICH ONE of the following states the effect on the pump discharge pressure and pump flow as the reactor pressure decreases from 960 to 150 psig? ASSUME no operator actions are taken.

a. The pressure decreases and the flow decreases.

b. The pressure remains constant and the flow remains constant.

c. The pressure decreases and the flow remains constant.

d. The pressure remains constant and the flow decreases.

ANSWER:

a.

COMMENTS:

We recommend that the correct response be changed to answer (b). When the HPCI System controller is operated in the "manual" mode, a constant speed signal is sent to the speed reference section. Since the HPCI turbine/pump speed will remain constant regardless of steam supply pressure, and the HPCI System is aligned in the "full flow test" mode, pump pressure and flow will remain constant.

REFERENCES:

- PNPS Instructor Guide O-RO-02-09-03, Pages IG-15-7/89 through IG-17-7/89 and Figure 11.
- PNPS System Description, HPCI System, Pages 16, 17 and 18 and Figure 11.

The oil is filtered by a duplex filter. Normally one filter element is in service allowing the other to be cleaned. A differential pressure detector actuates an alarm on panel 903 if 10-12 psid is sensed across the filter.

What would be ind':ated by a high filter differential pressure?

High pressure oil passing through the filter is fed to the EGR actuator oil pump of the governor control system and to a diaphragm operated pressure reducing valve.

TP-7

Oil at 30 psig is then fed from the pressure reducing valve via the oil cooler and thermostatic valve to the bearings. It is also fed via the restriction orifice to the mechanical-hydraulic automatic reset overspeed trip system and to the oil piston operated relay valve of the turbine stop valve for stop valve control oil.

The oil cooler is a straight tube type heat exchanger. The oil is cooled by water from the booster pump discharge. Outlet temperature is automatically maintained between 90° and 150°F by a temperature control valve. An alarm on panel 903 actuates if oil cooler outlet temperature reaches 155°F.

A pressure switch downstream of the thermostatic control valve actuates a bearing low pressure on panel 903 at 6 psig.

Discuss with the class how a failure of the HPCI Aux. Oil Pump would impact HPCI system operation/operability.

Temperature elements in the oil cooler discharge line, high and low pressure bearing oil drains, thrust bearing and main pump bearings input to a tempera-ture recorder on panel C-921.

(ELO-2) 7. HPCI Control System:

HPCI steam supply flowrate control varies the turbine speed. Speed is controlled by positioning the turbine control valves with hydraulic mechanical signals.

Discuss the speed control system TP-8.

The signals are generated by a flow controller on panel 903 or on alternate shutdown panel #C-158, depending on the position (LOCAL, REMOTE) of the flow indicator controller selector switch on panel C-158. Remote flow indicator controller (FIC) operation is possible only if the turbine test selector switch on panel 903 is in NORMAL, or a HPCI initiation signal is present, (which bypasses the turbine test selector switch) and the FIC switch at the alternate shutdown panel is in REMOTE.

When the turbine test selector switch is in TEST, a signal generator (panel 903) is put in the circuit that can be used for turbine overspeed trip testing and speed control circuitry testing. The test function is only possible when an initiation signal is not present.

The FT output is sent to a local FIC on C-158 or to the remote FIC on panel 903. This signal is then sent to the signal converter located in the same box as the ramp generator.

The signal converter produces a voltage signal that is linearly proportional to the turbine speed, which goes to a low signal selector. The other input to the low signal selector is from the ramp generator.

The ramp generator limits the rate at which the turbine control valves open when the system initiates, to prevent turbine overspeed.

The low signal selector senses the least positive input signal and sends that signal to the speed reference section in the electronic governor motor circuit. There, it is compared to with a speed set potentiometer signal. This determines the speed demand signal.

Actual turbine speed is determined by a magnetic pickup and a generates signal for two tachometers, (one for panel 903 indication, or for C-158 indication). The local/remote selector switch (C-158) (LOCAL, REMOTE) determines which speed

which speed indicator is operating, and where the actual speed signal for the control circuit is generated. The actual speed signal is summed with the demand signal and sent through an amplifier to the electric governor relay (EGR) actuator.

A EGR actuator adjusts a servomotor, which operates mechanical linkage on an oil relay. This changes the oil pressure sent to turbine control valve oil relay diaphragm, which changes valve position. The oil relay acts as a valve position feedback circuit to minimize oscillations. TP-10

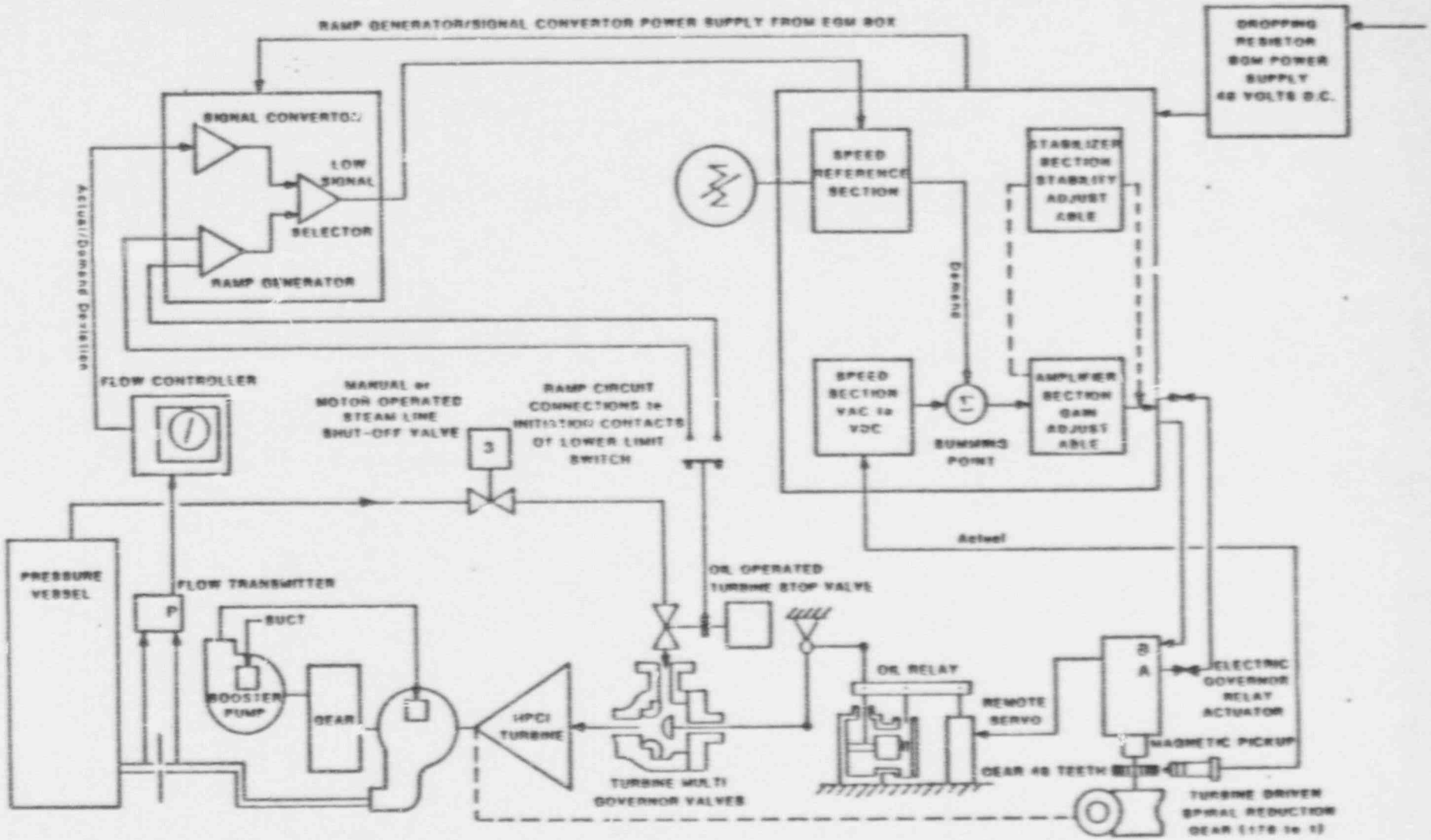
A FIC can be operated from panel 903 or locally on panel C-158. The FIC has three positions. In MAN, the flow controller output signal is adjusted using the potentiometer on the controller. In AUTO, the desired pump discharge flowrate is set with a tape, and the system will maintain this HPCI pump discharge flow automatically, regardless of steam supply pressure changes, by varying the position of the steam supply flow control valve. BAL allows balancing of the MAN and AUTO output signals for a smooth transfer between MAN and AUTO. Two 0-100 positions are provided. One allows reading the input signal to the controller in AUTO. The other allows reading the controller output signal while in MAN. Discuss switch positions.

The FICs are powered from DC/AC inverters. Loss of the control room inverter output signal actuates an inverter circuit failure alarm on panel 903. Loss of the DC logic power supply also activates an alarm on panel 903. The inverter can be reset with a pushbutton inside panel 903. Review DC/AC inverters.

The two position (ON, OFF) turbine test power selector switch on panel 903 energizes or deenergizes test circuitry.

(ELO-20) 8. HPCI Alternate Shutdown Panel (Panel #C-158)

a. Located in the Reactor Building on the 23 foot elevation, outboard of the West HCU bank.



HPCI TURBINE CONTROL SYSTEM

0-RO-02-09-03

FIGURE 11 REV. 1

TD-9

Two oil filters remove foreign particles in the oil supply lines. A differential pressure detector (DP-1) actuates an alarm on panel 903 if 10-12 psid is sensed across a filter. Only one filter is in service at a time. When a high differential pressure condition occurs the standby filter is placed in service while the other is cleaned. A filter selector valve (2301-130) determines and aligns the filter to be placed in service. These filters are equipped with normally closed vent valves and drain valves on the turbines southwest end. A lube oil pressure indicator allows monitoring oil pressure after the filter.

A downstream pressure switch (PS-2301-2) actuates a low pressure alarm (6 psig) on panel 903 and sends a signal to the turbine governor motor interlock.

7. Turbine Speed Control (Figure 6, 11, 12, 15)

The turbine speed control network maintains HPCI turbine speed during all operating modes by delivering hydraulic-mechanical positioning signals to the turbine control valves. The turbine speed control network is comprised of servo motor oil relay assembly, EG-M, ramp generator, signal converter and flow controllers (FIC).

Hydraulic-mechanical control signals position the throttle valve to vary HPCI turbine speed and therefore pump flow. Either the control room flow controller or the remote shutdown panel flow controller can generate the HPCI control signal.

The remote shutdown panel (C-158) flow controller generates the speed/flow control signal when the selector switch in panel C-158 is in the LOCAL position. Placing the selector switch in LOCAL also bypasses the HPCI electrical trips and initiating logic and routes the actual flow signal to the flow controller.

The control room panel flow controller on panel 903 generates the speed/flow control signal when the selector switch is in REMOTE, unless the HPCI turbine is being tested.

For a HPCI overspeed trip and speed control test, the test selector switch is placed in TEST. This disables both the flow controllers, giving speed control to the signal generator in panel 903. If HPCI automatic initiation signals are received during the test, the system will automatically go to the inject mode and the control room controller resumes speed/flow control. The test circuit is powered from V instrument bus Y-1.

Actual HPCI flow (figure 11) is sensed at a flow element in the HPCI pump discharge line. The flow signal goes to the flow controller. The local controller also sends a flow signal to FI-2340-2 on panel C-158.

The square root converters and flow controllers receive power from the stations 125 VDC battery. If the inverters output signal is lost, inverter circuit failure alarm is actuated on panel 903. If DC logic bus power is lost an alarm will activate on panel 903. When the cause is corrected, the inverter can be reset with a pushbutton on panel 903.

The FIC responds to a flow demand signal and adjusts steam flow to accommodate varying reactor pressure. The controller can be operated in either manual or automatic modes. The FIC is normally in AUTO with its tape set at 4250 gpm. In AUTO or BAL, flow demand signal, as determined by the FIC setpoint tape, controls turbine speed. The speed control circuit has a 0-4000 rpm range with the lowest flow corresponding to 2000 rpm. In MAN, the operator controls the output signal, by adjusting its manual control potentiometer.

The signal converter produces a positive or negative 125 VDC output to position the servo motor. The signal converter output signal is fed to a low signal selector, which also receives an input signal from a ramp generator. Upon system initiation, the flow controller will demand the control valves to open to the selected position. The ramp generator limits the rate at which the control valves open to prevent a turbine overspeed trip (figure 13). The ramp generator is automatically placed in service by stop valve position limit switches. When the stop valve is more than 3/16" from the full closed position, a limit switch (LS-3) closes contacts to the ramp generator circuit allowing an accelerate speed demand signal. When the stop valve is less than 3/16" from full closed, the accelerate speed demand circuit is opened and a limit switch (LS-4) closes an idle speed demand signal contact in the ramp generator circuit.

A selector switch on panel C-158 determines which speed indicator will receive the turbine speed signal. Turbine speed indication in the control room is supplied by tach SI-2340-1 on panel 903, and locally by tach S2-2340-2 on panel C-158. Both indicators have a 0-6000 rpm range. These tachometers also supply a turbine speed signal to the EG-M speed section through an AC to DC voltage inverter for speed feedback. The inverters output signal and the speed reference signal combine at a summer. The combined signal from the summer is sent to an adjustable gain amplifier section. An adjustable stabilizer circuit prevents speed signal oscillations in the gain amplifier's output signal. The gain amplifier adjusts the servo motor through an EG-R actuator. The servo motor operates mechanical linkage on the oil relay assembly which controls the control valves positioning linkage. The varying oil pressure controls the oil relay diaphragm which is connected to the control valve positioning linkage. The oil relay acts as a valve position feedback circuit to minimize valve oscillations. When the servo motor moves the linkage upward the control valves are sequentially opened.

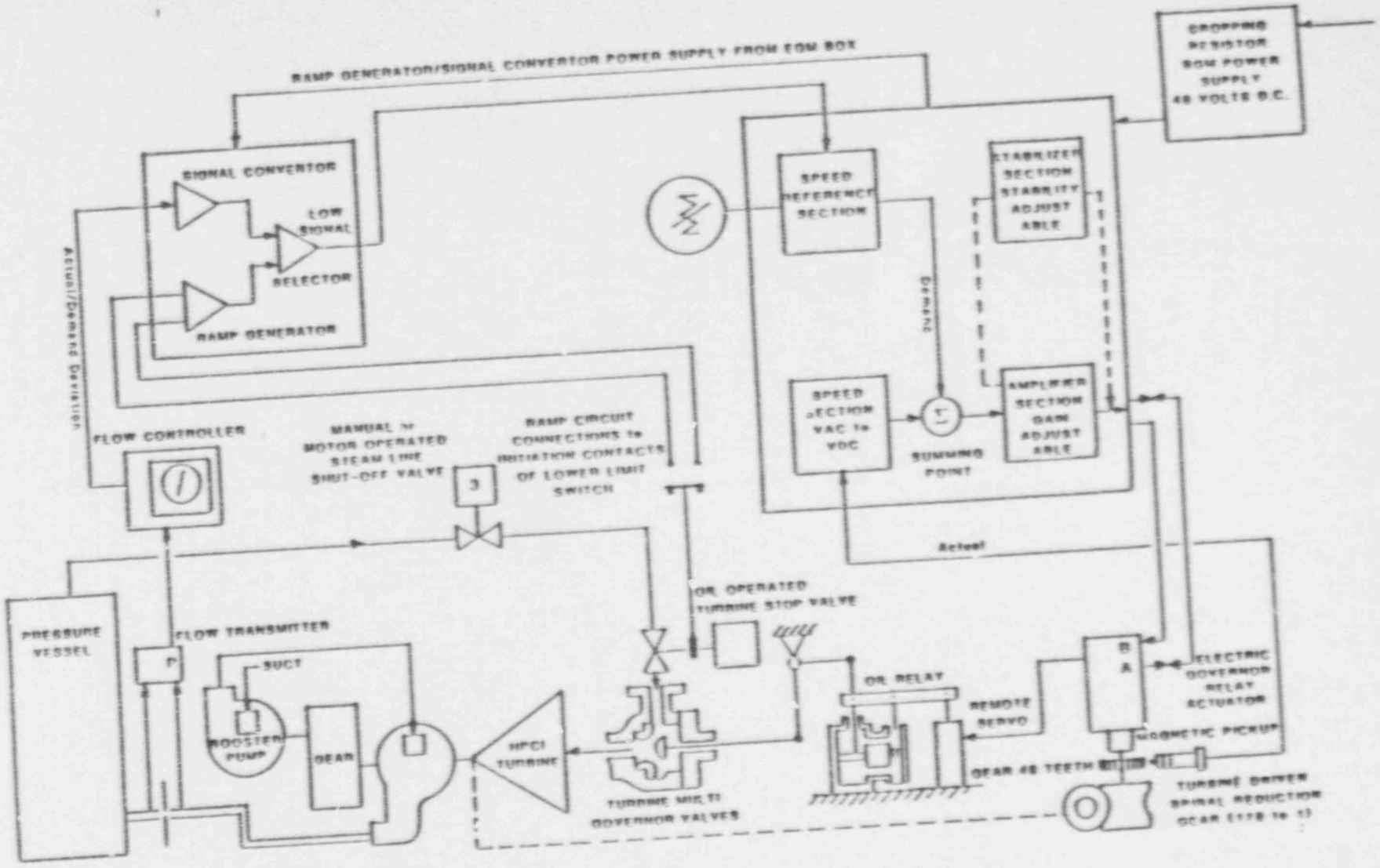
8. Turbine Drains and Gland Seal Leak Off System (Figure 3)

The turbine drain pot receives condensate from several locations and normally directs them through two steam traps to the torus below water area. If the drain pot level is high, the condensate is routed to the HPCI gland seal condenser.

The turbine drain pot receives condensate from the following:

- turbine exhaust piping low point drain
- turbine casing drains
- turbine steam ring drains (through restricting orifices)
- stop valve above seat drain (through a restricting orifice)
- stop valve below seat drain (through a restricting orifice)
- turbine steam chest drain (through a restricting orifice)

The drain pot normally drains through two Y-strainers and two steam traps. The Y-strainers filter any particles which could damage or block the steam traps. The steam traps allow only condensate (water) through them. If steam passes through them, they will heat up and shut.



HPCI TURBINE CONTROL SYSTEM

FIGURE 11 REV. 1

59600/66

QUESTION: 066 (1.00 Points)

Concerning Procedure EOP-2, "Failure to Scram", the significance of the [illegible] gal. change of SBLC tank level (or 8 drums of sodium pentaborate) value for injection is that at this value sufficient negative reactivity has been added to...

a. shutdown the reactor when RPV level is normal, all recirc. loops are open, the reactor is in hot standby and the reactor water cleanup system is in service with the filters and demineralizers bypassed.

b. satisfy the ATWS Rule (10 CFR 50.62) equivalency requirement and to assure that the reactor will be shutdown before unacceptable containment conditions develop.

c. overcome the combined effects of rated coolant voids, fuel doppler, Xenon, Samarium and temperature change plus shutdown margin from full power to less than 212 deg. F.

d. assure that the rate of positive reactivity insertion due to cool down of the reactor following the xenon peak is overridden by the rate of negative reactivity insertion due to boron injection.

ANSWER:

c.

COMMENTS:

We recommend that this question (#66) be deleted from the examination. The PNPS definition for "Hot Shutdown Boron Weight" (HSBW) does not match any of the provided responses. Each of the provided choices are either wholly incorrect or have at least a fifty percent inaccuracy. Based on this, there is no clear choice.

REFERENCES

- PNPS EOP-02 Student Guide, O-RO-03-04-04, Pages 9, 10 and 49
- PNPS EOP-02 Instructor Guide, O-RO-03-04-04, Pages 9, 10, 49 and TQ #5
- OEI Document 8390-4B, Page B-6-117

c. So, ADS initiation is prevented as the first action of the level control path. When required, explicit direction to depressurize the RPV is provided in the EOPs, thereby negating any requirement to maintain the automatic initiation capability of ADS.

6. Flowpath Step L-4. Hot S/D Boron Weight and Alternate Depressurization Overrides

a. When the hot shutdown boron weight is injected into the RPV (8 drums or a SLC storage tank change of 1100 gallons), the operator is directed to a subsection (R) of the RPV Level Control Flowpath to restore RPV level to the normal operating band and wait until the RPV Pressure Control Flowpath directs the operator to transfer to PNPS Procedure 2.1.5, "Controlled Shutdown from Power".

This will allow the boron solution in the lower head area to be mixed into the water circulating through the core. The EOPs do not assume that there is enough water in the core area to promote natural circulation so the EOP directs the raising of the water level in the RPV to the normal operating level.

The number "1" enclosed in a circle indicates that Note #1 is applicable to this override. Note #1 contains a table that is used to calculate the final level of the SLC Storage Tank which corresponds to the injection of the Hot S/D Boron Weight (HSBW) and the Cold S/D Boron Weight (CSBW).

(ELO 14) The HSBW assumes:

1) Control rods are at the maximum rod block position

2) The core is at the most reactive time in the cycle

3) No xenon in the core

4) No voids in the core

5) RPV level is +48"

6) Moderator temperature is at the saturation temperature of the lowest lifting SRV pressure

b. If Alternate Depressurization is required, the operator is directed to a subsection (P) of the RPV Level Control Flowpath to perform steps which will help ensure that the depressurization will not cause a rapid increase in reactor power, and subsequent core damage.

7. Rapid Injection Caution

The next item in the RPV Level Control Flowpath is a caution concerning the rapid injection of water into the RPV. This orange rectangle reminds the operator that a sudden, cold addition of unborated water into the core can cause a rapid increase in power and substantial core damage.

8. Flowpath Step L-5. Primary Containment Threat Override

(ELO 6, 22a) a. The operator is informed of the conditions which could threaten primary containment integrity:

1) Reactor Power > 3%, or cannot be determined

The reactor is supplying heat energy to the containment, or there is uncertainty as to what energy, if any, is being added by the reactor to the containment.

2) Torus Water Temperature > BIIT (FIGURE 4)

(ELO 14) 14. Flowpath Step Q-14. When SLC has been Injected

a. This step has the operator wait until the CSBW has been injected into the core. At this point, the reactor is assured to remain shutdown by boron under all conditions. This assumes:

1) Control rods are fully withdrawn (position 48)

2) Reactor core is at its most reactive point in the cycle

3) No voids are present in the core

4) No xenon is present in the core

5) Moderator temperature is at the most reactive (coldest) temperature

6) RPV level is at +48"

7) The SLC system is in service (added volume for boron dilution)

b. After the CSBW has been injected, the operator is directed to exit the RPV Power Control Flowpath and enter PNPS Procedure 2.1.6, "Reactor Scram".

c. This is the same condition which allows the operator to exit the RPV Pressure Control Flowpath at step P-14, which also directs the operator to exit the RPV Level Control Flowpath at step L-33.

(ELO 23) 15. Flowpath Step Q-15. Perform Alternate Rod Insertion, Procedure 5.3.23

This step is performed concurrently with the boron injection actions. Training on this procedure, and its use in the plant/simulator will provide a high degree of familiarity with the alternate methods of rod insertion.

a. This step directs the operator to perform the Alternate Rod Insertion Procedure, 5.3.23. It then lists the various methods to insert control rods by alternate means.

c. So, ADS initiation is prevented as the first action of the level control path. When required, explicit direction to depressurize the RPV is provided in the EOPs, thereby negating any requirement to maintain the automatic initiation capability of ADS.

6. Flowpath Step L-4. Hot S/D Boron Weight and Alternate Depressurization Overrides TP-1

a. When the hot shutdown boron weight is injected into the RPV (8 drums or a SLC storage tank change of 1100 gallons), the operator is directed to a subsection (R) of the RPV Level Control Flowpath to restore RPV level to the normal operating band and wait until the RPV Pressure Control Flowpath directs the operator to transfer to PNPS Procedure 2.1.5, "Controlled Shutdown from Power".

This will allow the boron solution in the lower head area to be mixed into the water circulating through the core. The EOPs do not assume that there is enough water in the core area to promote natural circulation so the EOP directs the raising of the water level in the R. to the normal operating level.

The number "1" enclosed in a circle indicates that Note #1 is applicable to this override. Note #1 contains a table that is used to calculate the final level of the SLC Storage Tank which corresponds to the injection of the Hot S/D Boron Weight (HSBW) and the Cold S/D Boron Weight (CSBW).

(ELO 14) The HSBW assumes:

1) Control rods are at the maximum rod block position

2) The core is at the most reactive time in the cycle

3) No xenon in the core

4) No voids in the core

5) RPV level is +48"

6) Moderator temperature is at the saturation temperature of the lowest lifting SRV pressure

b. If Alternate Depressurization is required, the operator is directed to a subsection (P) of the RPV Level Control Flowpath to perform steps which will help ensure that the depressurization will not cause a rapid increase in reactor power, and subsequent core damage.

7. Rapid Injection Caution

The next item in the RPV Level Control Flowpath is a caution concerning the rapid injection of water into the RPV. This orange rectangle reminds the operator that a sudden, cold addition of unborated water into the core can cause a rapid increase in power and substantial core damage.

8. Flowpath Step L-5. Primary Containment Threat Override TP-1

(ELO 6, 22a) a. The operator is informed of the conditions which could threaten primary containment integrity:

1) Reactor Power > 3%, or cannot be determined

The reactor is supplying heat energy to the containment, or there is uncertainty as to what energy, if any, is being added by the reactor to the containment.

2) Torus Water Temperature > BIIT (FIGURE 4)

(ELO 14) 14. Flowpath Step Q-14. When SLC has been Injected

a. This step has the operator wait until the CSBW has been injected into the core. At this point, the reactor is assured to remain shutdown by boron under all conditions. This assumes:

1) Control rods are fully withdrawn (position 48)

2) Reactor core is at its most reactive point in the cycle

3) No voids are present in the core

4) No xenon is present in the core

5) Moderator temperature is at the most reactive (coldest) temperature

6) RPV level is at +48"

7) The SDC system is in service (added volume for boron dilution)

b. After the CSBW has been injected, the operator is directed to exit the RPV Power Control Flowpath and enter PNPS Procedure 2.1.6, "Reactor Scram".

c. This is the same condition which allows the operator to exit the RPV Pressure Control Flowpath at step P-14, which also directs the operator to exit the RPV Level Control Flowpath at step L-33.

(ELO 23) 15. Flowpath Step Q-15. Perform Alternate Rod Insertion, Procedure 5.3.23

This step is performed concurrently with the boron injection actions. Training on this procedure, and its use in the plant/simulator will provide a high degree of familiarity with the alternate methods of rod insertion.

a. This step directs the operator to perform the Alternate Rod Insertion Procedure, 5.3.23. It then lists the various methods to insert control rods by alternate means.

QUESTION: Discuss the difference between the Hot and Cold Shutdown Boron weights.

ANSWER: The Hot Shutdown Boron weight (change of 1100 gallons in the Boron Tank level or the addition of 8 drums of SLC) is that amount of Boron that will maintain the reactor shutdown under Hot Standby condition. The Hot Shutdown Boron Weights takes into account:

a. Control rods are withdrawn to their maximum rod block position.

b. The core is at its most reactive time in the fuel cycle.

c. No credit is taken for Xenon negative reactivity.

d. No credit is taken for negative reactivity due to voids.

e. RPV level is at +48".

f. Moderator temperature is at the saturation temperature for the lowest SRV lift pressure (1095#).

The Cold Shutdown Boron Weight (change of 1600 gallons in the Boron tank level or the addition of 11 drums of SLC) is that amount of Boron that will maintain the reactor shutdown under all conditions. The Cold Shutdown weight takes into account.

a. Control rods are fully withdrawn (position 48).

b. Reactor core is at its most reactive exposure.

c. No Xenon present in the core.

d. No voids present in the core.

e. Moderator temperature at most reactive temperature.

f. RPV level at +48".

g. Shutdown cooling is in service (added volume).

REFERENCE: O-RO-03-04-04, ELO 14.

OPERATOR ACTIONS

RC/Q-6.2 Continue to inject boron until [700 pounds (Cold Shutdown Boron Weight)] of boron have been injected into the RPV.

DISCUSSION:

Boron injection is continued until sufficient boron has been injected into the RPV to maintain the reactor shutdown under cold conditions irrespective of control rod position, or until conditions specified in the overrides which apply to this step become effective. This precludes a return to criticality with a potential positive temperature coefficient as the RPV is depressurized and cooled down to cold shutdown conditions.

The Cold Shutdown Boron Weight is defined to be the least weight of soluble boron which, if injected into the RPV and mixed uniformly, will maintain the reactor shutdown under all conditions. The basis for the Cold Shutdown Boron Weight is discussed in Appendix A, and the procedure for calculating the plant-specific value is contained in Appendix C.

A weight of boron is specified, rather than an SLC tank level, to accommodate alternate boron injection mechanisms.

Attachment 4

Simulator Fidelity Report

Simulator Fidelity Report

Facility Licensee: Pilgrim Nuclear Power Station

Facility Docket No.: 50-293

Operating Tests Administered on: December 3 - 5, 1991

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 non-compliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

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

1. In the FWLC system, the candidates were unable to bias out the level error between the Master Controller and the FRV controller. The facility explained that this was due to a hardware problem.

2. The RWM and RBM had to be bypassed at power levels greater than 20% due to imposing rod blocks when withdrawing control rod at 28% power.

3. There was only a limited number of ATWS scenarios that could be performed. This caused a lack of adequate diversity to test at a greater depth ATWS situations.