

November 9, 2000

Mr. Michael A. Balduzzi
Vice President, Operations
Vermont Yankee Nuclear Power Corporation
185 Old Ferry Road
P.O. Box 7002
Brattleboro, Vermont 05302-7002

SUBJECT: VERMONT YANKEE SENIOR REACTOR OPERATOR AND REACTOR
OPERATOR INITIAL EXAMINATION REPORT No. 05000271/2000-301

Dear Mr. Balduzzi:

This report transmits the results of the subject operator licensing examinations conducted by the NRC during the period of September 15 through 21, 2000. These examinations addressed areas important to public health and safety and were developed and administered using the guidelines of the "Examination Standards for Power Reactors" (NUREG-1021, Revision 8).

Based on the results of the examinations, all six applicants (two instant Senior Reactor Operator (SRO) and four Reactor Operator (RO)) passed all portions of the examinations. The preliminary performance insights observed during the examination were discussed between Mr. P. Bissett and Mr. M. Gosekamp on September 21, 2000. The final results were discussed via telephone conference call on October 11, 2000, with Mr. M. Gosekamp.

There was one green finding identified during this examination. This green finding involved an inadequate operating procedure. This finding was determined to be a violation of NRC requirements, however, this violation was not cited due to its very low safety significance and because it was entered into your corrective action program. If you contest this non-cited violation, you should provide a response within 30 days of the date of this examination report, with the basis for your denial, to the United States Regulatory Commission, ATTN: Document Control Desk, Washington D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at the Vermont Yankee facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Mr. Michael A. Balduzzi

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Should you have any questions regarding this examination, please contact me at (610) 337-5183, or by E-mail at RJC@NRC.GOV.

Sincerely,

/RA/

Richard J. Conte, Chief
Operational Safety Branch
Division of Reactor Safety

Docket No. 05000271
License No. DPR-28

Enclosure: Initial Examination Report No. 05000271/2000-301 w/Attachments 1-4

Attachments:

1. SRO Written Exam w/Answer Key
2. RO Written Exam w/Answer Key
3. Licensee Post-Examination Comments
4. Resolution of Post-Examination Comments

cc w/encl; w/Attachments 1-4:

B. Finn, Manager - Training

cc w/encl; w/o Attachment 1-4:

R. McCullough, Operating Experience Coordinator - Vermont Yankee
G. Sen, Licensing Manager, Vermont Yankee Nuclear Power Corporation
J. A. Hutton, Director-Licensing, AmerGen Energy Coompany
D. Rapaport, Director, Vermont Public Interest Research Group, Inc.
D. Tefft, Administrator, Bureau of Radiological Health, State of New Hampshire
Chief, Safety Unit, Office of the Attorney General, Commonwealth of Massachusetts
D. Lewis, Esquire
G. Bisbee, Esquire
J. Block, Esquire
T. Rapone, Massachusetts Executive Office of Public Safety
D. Katz, Citizens Awareness Network (CAN)
M. Daley, New England Coalition on Nuclear Pollution, Inc. (NECNP)
State of New Hampshire, SLO Designee
State of Vermont, SLO Designee
Commonwealth of Massachusetts, SLO Designee

Mr. Michael A. Balduzzi

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Distribution w/encl; w/Attachments 1-4:

C. Buracker, DRS (Master Exam File-Original)

Distribution w/encl; w/o Attachments 1-4:

Region I Docket Room (with concurrences)

W. Lanning, DRS

P. Bissett, Chief Examiner, DRS

R. Conte, DRS

B. McDermott, DRP - NRC Resident Inspector

C. Buracker, DRS (OL Facility File)

H. Miller, RA

J. Wiggins, DRA

G. Meyer, DRP

R. Barkley, DRP

C. O'Daniell, DRP

M. Oprendeck, DRP

Distribution w/encl; w/o Attachments 1-4 (VIA E-MAIL):

J. Shea, RI EDO Coordinator

E. Adensam, NRR (ridsnrrdlpmlpdi)

R. Croteau, NRR

D. Thatcher, NRR

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NAME	PBissett <i>PB</i>	GMeyer <i>GM</i>	JMT/JTS <i>JMT</i>		RConte <i>R</i>		
DATE	11/08/00	10/8/00	10/9/00		10/9/00		11/ /00

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 05000271

Report Nos: 05000271/2000-301

Licensee: Vermont Yankee Nuclear Power Corporation

Facility: Vermont Yankee

Location: Vernon, VT

Dates: September 15 - 21, 2000 (Operating and Written Test Administration)
September 25 - October 6, 2000 (Grading)

Chief Examiner: P. Bissett, Senior Operations Engineer/Examiner

Examiners: J. Caruso, Operations Engineer/Examiner
T. Fish, Operations Engineer/Examiner

Approved By: Richard J. Conte, Chief
Operational Safety Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000271-00-301; on 09/15-21/2000; Vermont Yankee; Initial Operator Licensing Examination. Six of six applicants passed (2 SRO and 4 RO).

The examination was conducted by NRC region-based examiners. The examination team identified one green finding which was a non-cited violation of low safety significance. The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process in Inspection Manual Chapter 0609.

NRC Identified Findings

Cornerstone: Initiating Events

- Green. The examination team identified a Non-Cited Violation for an inadequate procedure. The applicants were unable to reset an RPS half-scam signal due to an inadequate procedure that they were following during the conduct of an in-plant JPM.

The finding was determined to be Green (of very low safety significance) using Phase 1 of the SDP because the procedure inadequacy (Technical Specification 6.4) would only have delayed resetting the half scram. The licensee entered the finding into the corrective action program.

Report Details

4. OTHER ACTIVITIES (OA)

4OA4 Cross-Cutting Issues

Reactor Operator and Senior Reactor Operator Initial License Examinations

a. Inspection Scope

The NRC developed both the written and operating examinations. The NRC examination team subsequently reviewed with the Vermont Yankee training staff the written and operating initial examinations to verify or ensure, as applicable, the following:

- That the examination was prepared and developed in accordance with the guidelines of Revision 8 of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." The review was conducted both in the Region I office and at the Vermont Yankee facility. Final resolution of comments and incorporation of test revisions was conducted during and following the onsite preparation week.
- Proper simulation facility operation.
- Facility licensee completed a test item analysis for feedback into the systems approach to training programs.
- Examination security requirements met.

The NRC examiners administered the operating portion of the exam to all applicants from September 19 through 21, 2000. The written examinations were administered by Vermont Yankee training staff on September 15, 2000.

b. Issues and Findings

Grading and Results

All six applicants (2 SROs and 4 ROs) passed all portions of the initial licensing examination.

The facility had two post-examination comments (see Attachments 3 and 4).

Examination Preparation and Quality

Following the validation of the examination on-site, an NRC inspector found a one page outline of the ten JPMs to be administered during the exam week in the room in which the exam team had been working out of during the preparation week. The NRC inspector notified the licensee and also a member of the NRC exam team of his discovery. The one page outline listed proposed test items, only, and had no actual exam material attached. When questioned about who may have used or been in the room after the exam team left the site, the facility staff could not demonstrate that room access had been controlled or restricted. Although there was no evidence that the exam

had been compromised, the NRC staff and the facility representatives felt that the potential for a compromise had existed. As a result, the exam team decided to develop, with the help of the licensee's training staff, ten new JPMs to replace those that had originally been scheduled for exam implementation. The ten new JPMs that were selected were appropriately reviewed to ensure that they did not duplicate other material that was covered on other portions of the overall examination.

Examination Administration and Performance

An observation and finding were identified by the examination team during the conduct of the operating examination. The observation dealt with emergency classifications. Two SRO applicants were given the same scenario and were asked to classify the event as part of their follow-up questioning. One applicant determined that the event would have been classified as an Alert and the other applicant determined the event would have been classified as a Site Area Emergency (SAE). The applicants had both referred to the bases for AP 3125, Appendix "A", section S-2-b, on inability to maintain water level >-48" but came up with different results. In reviewing the scenario events/plant conditions and the bases document, the operations training department supervisor determined that the declaration of an SAE would have been overly conservative. A training change request (00-0435) was written to document an operations training commitment to review the bases for EAL s-2-b and emphasize that the SAE determination is not required for transient conditions where level falls below -48" as a part of an RPV-ED process. In addition, an action item/regulatory commitment item (UND-2000-0106_00) was initiated for operations department to review the bases for AP 3125, Appendix "A", section S-2-b, on inability to maintain water level >-48".

A finding was identified during the administration of an in-plant JPM (21205) "Respond to a reactor protective system (RPS) power panel trip." OP 2134, "Reactor Protection System", revision 16, section F, "RPS Power Protection Panel Trip" provided inadequate guidance to the applicants as written. Step 5 did not recognize that a trip of RPS Power Protection Panel PPP-A-1 would also result in a trip of PPP-A-2 (in series with PPP-A-1). Thus, in this case, both power panels were affected and needed to have power restored. The JPM, consequently as written, was also deficient. A procedure change request was initiated following the exam to correct this problem. It is important to note that the applicants for the most part were knowledgeable and identified this procedure deficiency and identified it to the examiners during the administration of the JPM. The net affect of this procedure inadequacy would have delayed resetting a half scram, resetting a group 3 containment vent isolation, and the loss of a narrow range level transmitter in the control room (LT 2-3-57A), however, this delay would not have had direct or immediate impact on safety related actions. The inadequate procedure, OP 2134, is a violation of technical specifications, section 6.4 which states in part, "Written procedures shall be established, implemented and maintained...". The safety significance is an increased vulnerability to a plant scram with the existing half scram not reset.

This finding was considered more than minor because it has a credible impact or affect on safety. This finding was determined to be Green (of very low safety significance) using Phase 1 of the significance determination process (SDP) under the initiating event cornerstone as transient initiator contributor to a reactor trip (no direct impact on safety

related functions). This issue is being treated as a Non-Cited Violation consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR 25368) (NCV 050000271/2000-301-01).

4OA6 Exit Meeting Summary

On September 21, 2000, the NRC Chief Examiner discussed preliminary overall observations noted during the examination with the Manager, Operations Training. On October 11, 2000, the Chief Examiner provided final conclusions and examination results to Vermont Yankee management representative, Mr. M. Gosekamp, Manager, Operations Training and other management personnel, via telephone. License numbers for the six applicants were also provided during the final exit meeting.

The NRC also expressed appreciation for the cooperation and assistance that was provided during the preparation and administration of the exam by the licensee's training staff, especially in regard to their help in generating the 10 new JPMs.

PARTIAL LIST OF PERSONS CONTACTED

FACILITY

M. Gosekamp, Manager, Operations Training
T. Autry, Operator Training Instructor
W. Schultz, Training Instructor

NRC

P. Bissett, Senior Operations Engineer/Examiner
J. Caruso, Operations Engineer/Examiner
T. Fish, Operations Engineer/Examiner
S. Dennis, Operations Engineer/Examiner

SUMMARY OF ITEMS OPENED, CLOSED AND DISCUSSED

<u>ITEM NUMBER</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
050000271/2000-301-01	NCV	NRC identified that procedure OP 2134, "Reactor Protection System", revision 16, section F, "RPS Power Protection Panel Trip" provided inadequate guidance for restoring power to RPS.

Attachment 1

SRO WRITTEN EXAM W/ANSWER KEY

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

APPLICANT'S NAME: _____

FACILITY: _____ VERMONT YANKEE _____

REACTOR TYPE: _____ BWR-GE _____

DATE ADMINISTERED: _____

INSTRUCTIONS TO APPLICANT:

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 80.00%. Examination papers will be picked up five (5) hours after the examination starts.

TEST VALUE	APPLICANT'S SCORE	FINAL GRADE %
100.00		

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

Applicant's Signature

SENIOR REACTOR OPERATOR ANSWER SHEET

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

SENIOR REACTOR OPERATOR ANSWER SHEET

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 will result in denial of your application and/or action against your license.
2. After you complete the examination, 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.
3. To pass the examination, you must achieve a grade of 80.00% or greater; grades will not be rounded up to achieve a passing score. Every question is worth one point.
4. There is a nominal time limit of five (5) hours for completing the examination; extensions will be granted if anyone needs more time to complete the exam.
5. You may bring pencils, pens, and calculators into the examination room. Use black ink to ensure legible copies; dark pencil should be used only if necessary to facilitate machine grading.
6. Print your name in the blank provided on the examination cover sheet and each answer sheet.
7. Mark your answers on the answer sheet provided and do not leave any question blank. Use only the paper provided and do not write on the back side of the pages. If you are using ink and decide to change your answer draw a single line through the error, enter the desired answer, and initial the change.
8. If you have any questions concerning the intent of the initial conditions of a question, do not hesitate asking them before answering the question. Ask questions of the facility instructor/proctor only. When answering a question, do not make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the questions so states or the alarm is expected to activate as a result of the conditions that are stated in the question. Finally, answer all questions based on actual plant operation, procedures, and references. If you believe that the answer would be different based on simulator operation or references, you should answer the question based on the actual plant.
9. Restroom trips are permitted but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

10. When you complete the examination, assemble a package including the examination questions, examination aids and answer sheets and scrap paper and give it to the exam proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination. Scrap paper will be disposed of immediately after the examination.
11. After you have turned in your examination, leave the examination area as defined by the proctor. If you are found in this area while the examination is still in progress, your license may be denied or revoked.
12. Do you have any questions?

Question: 1 (1.00)

A control room trend recorder for a Technical Specification parameter that is required to be continuously monitored has become inoperable.

WHICH ONE of the following describes operator actions in response to the inoperable trend recorder in accordance with AP-0150?

- a. Attach a yellow sticker to the recorder.
Log the parameter every 15 minutes.
- b. Attach a yellow sticker to the recorder.
Log the parameter every 60 minutes.
- c. Attach a caution tag to the recorder.
Log the parameter every 15 minutes.
- d. Attach a caution tag to the recorder.
Log the parameter every 60 minutes.

Question: 2 (1.00)

Plant conditions are as follows:

- Drywell pressure is 54 psig.
- Torus pressure is 55 psig.
- Drywell temperature is 360°F.
- Torus level is 22 ft.

WHICH ONE of the following describes the required action(s)?

- a. Spray the drywell.
- b. Spray the drywell and the torus.
- c. Spray the drywell and then RPV-ED.
- d. RPV-ED and then vent the Torus.

Question: 3 (1.00)

The plant is operating at 65% power with only one outstanding LCO:

The "A" Core Spray pump is INOP due to an in-progress repair. There is no estimate of repair time. The system was declared INOP on the previous shift.

One hour into the shift, HPCI fails its scheduled surveillance due to a pump impeller failure and is declared INOP. There is no estimate of repair time.

Which one of the following actions describes the required Tech Spec actions?

- a. Power operation may continue for the next 7 days, provided, all active components of the other Core Spray Subsystem, the LPCI Subsystems, and the diesel generators required for operation of such components, if no external power were available, shall be operable.
- b. Power operation may continue for the next 7 days, provided, all active components of ADS, LPCI subsystems and the RCIC system are operable.
- c. An orderly shutdown of the reactor shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.
- d. An orderly shutdown shall be initiated and the reactor pressure shall be less than or equal to 150 psig within 24 hours.

Question: 4 (1.00)

The unit is at 80% power

- An applicable Tech Spec Surveillance with a 24 hour frequency was last performed satisfactorily at 0900 on 9/1/00.
- The LCO Required Actions direct that the equipment be restored to OPERABLE status in 4 hours, or be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in 36 hours.

It was discovered at 0900 on 9/2/00 that a scheduling error had prevented the surveillance from being performed. What would be the latest time that the unit would be required to be in COLD SHUTDOWN?

- a. By 2100 on 9/3/00
- b. By 0100 on 9/4/00
- c. By 0700 on 9/4/00
- d. By 0100 on 9/5/00

Question: 5 (1.00)

Given the following conditions:

- An operator returns from a 7-day vacation on January 6.
- The operator stands 3 normal 12-hour shifts prior to becoming ill
- The operator returns to work after his extended illness on April 1

Per 10 CFR 55, which of the following describes what the operator must do, in part, to comply with the conditions of his license?

- a. Stand a minimum of 2 shifts prior to April 6.
- b. Stand a minimum of 5 shifts prior to April 6.
- c. Completes at least 40 hours on shift time in the calendar quarter.
- d. Complete a minimum of 40 hours of shift function under instruction.

Question: 6 (1.00)

A Post-Maintenance Test (PMT) requires the performance of a portion of a surveillance test to stroke time a valve following maintenance to prove OPERABILITY. The Supervisory Control Room Operator notes that the acceptance criteria for valve stroke time needs to be changed due to a recent Tech Spec revision.

Which of the following describes the MINIMUM required procedure change in accordance with AP-0097 to use the surveillance test to complete this PMT?

- a. A "Pre-approved Limited Procedure Change"
- b. A "Provisional Limited Procedure Change"
- c. A "One Time Only Change"
- d. A "Permanent Change"

Question: 7 (1.00)

As the refuel floor operator, you are removing a fuel channel. The channel fastener has been removed and you are in the process of removing the channel. While lowering the prep machine, the channel holder tool indicator is indicating a red color.

WHICH ONE of the following describes the significance of the red color on the indicator?

- a. Excessive load has been reached.
- b. Excessive peak load is being approached.
- c. The channel is moving freely and easily.
- d. Separation of the channel and fuel assembly has occurred.

Question: 8 (1.00)

WHICH ONE of the following describes the effects on the MSIVs and SBGT of a continuing decrease in instrument air header pressure and reactor water level is at 125 inches?

- a. Outboard MSIVs close
SBGT valves remain in normal line up
- b. Inboard MSIVs close
SBGT valves line up for initiation
- c. Outboard MSIVs close
SBGT valves line up for initiation
- d. Inboard MSIVs close
SBGT valves remain in normal line up

Question: 9 (1.00)

An Unusual Event (UE) had been declared.

When the UE conditions no longer exist, WHICH ONE of the following is the lowest level emergency plan position that can authorize termination of the UE?

- a. Shift Supervisor/Plant Emergency Director
- b. TSC Coordinator
- c. OSC Coordinator
- d. Site Recovery Manager

Question: 10 (1.00)

A fully qualified VY radiation worker with all previous exposure history on file has received 2550 mRem through the month of July 2000.

Which of the following is the maximum remaining Total Effective Dose Equivalent (TEDE) exposure this individual is allowed to receive without exceeding the VY administrative limit for the remainder of the year?

- a. 0.45 Rem
- b. 1.55 Rem
- c. 1.95 Rem
- d. 2.45 Rem

Question: 11 (1.00)

A mechanical technician, assigned to repair a safety-related check valve in a high radiation area, will exceed the annual VY radiation exposure administrative limits in order to complete the task.

As per AP 0506, Personnel Monitoring, what two individuals are required to approve this request?

- a. Maintenance Supervisor and Radiation Protection Supervisor.
- b. Maintenance Supervisor and Radiation Protection Manager
- c. Plant Manager and Radiation Protection Supervisor.
- d. Plant Manager and Radiation Protection Manager

Question: 12 (1.00)

Given the following conditions:

- A scheduled surveillance is required to be performed on a system in a radiation area.
- All radiological precautions have been taken and a pre-evolution brief has been completed.

Using the As Low As Reasonably Achievable (ALARA) guidelines, which of the following is the PREFERRED method for completing this surveillance? (Consider only the personnel aspects of this surveillance.)

- a. One individual installing shielding in a 90 mR/hr area for 30 minutes then performing the surveillance in a 9 mR/hr area for 60 minutes.
- b. One individual performing the surveillance in a 90 mR/hr area for 60 minutes.
- c. Two individuals installing shielding in a 90 mR/hr area for 15 minutes then both perform the surveillance in a 9 mR/hr for 35 minutes.
- d. Two individuals performing the surveillance in a 90 mR/hr area for 35 minutes.

Question: 13 (1.00)

The unit is at 100% power when the following timeline commences:

- At 1600, Severe winter storm warnings are in effect with high winds expected.
- At 1630, the Shift Supervisor, with concurrence from the Operations & Plant Managers, directs a unit shutdown using OT 3100, Manual Scram. Following the Manual Scram, 8 control rods are at unknown positions and reactor power is at 3%. Wind velocity onsite is now at 80 mph.
- At 1700, the storm causes a complete loss of offsite power. Both Emergency Diesel Generators (EDGs) failed to start. The Crew was successful at starting "A" EDG, but have been unable to close the output breaker. Reactor water level is at - 50" and decreasing.

It is currently 1718. Using the appendices of AP 3125 provided, classify these conditions to determine the appropriate current emergency action level.

- a. Unusual Event
- b. Alert
- c. Site Area Emergency
- d. General Emergency

Question: 14 (1.00)

A reactor scram due to a high drywell condition has occurred. All systems and components responded appropriately to the scram. Which of the following describes the state of the selected components?

- a. RPS Scram Solenoids deenergized, Backup Scram Solenoids deenergized, ARI/RPT Solenoids deenergized, SDV Vent and Drain Valve Solenoids deenergized
- b. RPS Scram Solenoids deenergized, Backup Scram Solenoids energized, ARI/RPT Solenoids deenergized, SDV Vent and Drain Valve Solenoids deenergized
- c. RPS Scram Solenoids energized, Backup Scram Solenoids energized, ARI/RPT Solenoids energized, SDV Vent and Drain Valve Solenoids energized
- d. RPS Scram Solenoids energized, Backup Scram Solenoids deenergized, ARI/RPT Solenoids energized, SDV Vent and Drain Valve Solenoids energized

Question: 15 (1.00)

A brief rod insert signal is initially applied to the Control Rod Drive Mechanism during a withdrawal sequence in order to:

- a. pressurize the underside of the collet piston forcing and holding the collet fingers away from the index tube.
- b. to provide cooling water flow through the insert port and through the cooling water orifice between the thermal sleeve and outer cylinder.
- c. to reposition the ball check valve to direct drive pressure to the top of the drive piston to force it downward.
- d. lift the index tube 2-3 inches in order to remove the weight of the rod from the collet fingers.

Question: 16 (1.00)

Given the following conditions:

- Reactor power is 50%
- Core flow is 27.5 Mlbm/hr
- Feedwater flow is 2 Mlbm/hr
- Reactor level is +160 inches
- Turbine stop valve testing is in-progress

A malfunction in the turbine stop valve test circuitry results in the closing of the turbine stop valves.

Which of the following describes the plant response to this malfunction? (Assume no operator action).

- a. The reactor scrams on high neutron level.
- b. The reactor scrams on high pressure.
- c. The reactor scrams on turbine stop valve position.
- d. The reactor scrams on generator load reject.

Question: 17 (1.00)

Given the following conditions:

- Reactor level is +70 inches and falling.
- Reactor pressure 400 psig is decreasing slowly.
- Cooldown rate is 100°F.
- Drywell Pressure is 2.8 psig..
- the RHR system is running, but the injection valves (RHR-27A/B) are closed.
- the HPCI/RCIC systems are unavailable.
- the reactor feedwater pumps have tripped.

As the CRO you are directed to maintain reactor water level. Your attempts to open the RHR-27A are unsuccessful. Which of the following statements describes what your next actions should be?

- a. Open the RHR-27B injection valve.
- b. Perform an emergency depressurization.
- c. Open main steam bypass valves to reduce reactor pressure.
- d. Monitor reactor pressure until it is less than 350 psig then verify RHR-27A/B opens.

Question: 18 (1.00)

Given the following:

- Reactor was scrammed from 100% due to a total loss of feedwater transient.
- Reactor level dropped to 77 inches and then rapidly increased to the normal operating range.

The SCRO directs the CRO to secure the A Loop of RHR. The CRO takes the control switch for RHR injection valve (RHR 27A) to close; however, the valve did not remain closed (valve closed then reopened). In order for the 27A valve to close the CRO must first:

- a. Place the RHRSW A&C LPCI AUTOSTOP OVERRIDE SWITCH to the AUTO position.
- b. Place the UPS FDR BLOCK KEYLOCK SWITCH to the NORMAL position.
- c. Reset the RHR A/C LOGIC LPCI/RECIRC VALVE RESET.
- d. Reset the A/C LOGIC CONTAINMENT SPRAY VALVE AUTO SIGNAL RESET.

Question: 19 (1.00)

The reactor automatically scrammed due to low reactor water level. While the HPCI system was injecting to raise reactor level, the system isolates on a valid isolation signal. As the CRO, you note the HPCI-25, Min Flow Valve, remains open. As per OP 2120, HPCI System, you close the valve. What is the basis for this action?

- a. To prevent pump run-out during subsequent automatic restart.
- b. To ensure containment isolation with a valid isolation signal.
- c. To prevent siphoning torus water into the HPCI piping .
- d. To prevent the inadvertent draining of the CST to the torus.

Question: 20 (1.00)

When manually starting the HPCI system, the turbine steam supply valve, HPCI-14, is opened prior to starting the auxiliary oil pump.

Which of the following statements describes the reason for this sequence?

- a. To preclude potential HPCI isolation on high steam flow.
- b. To prevent warping the HPCI turbine blades.
- c. To ensure HPCI-14 valve operability prior to placing HPCI system in service.
- d. To ensure the ramp generator initiates the ramp function prior to opening the turbine stop valve.

Question: 21 (1.00)

Given the following conditions:

- LOCA with a loss of normal power has occurred
- Diesel Generator B fails to start
- Reactor Pressure is 250 psig
- Drywell Pressure is 4 psig

The CRO is able to energize the 4 KV Bus 3 from the Vernon Tie line.

Assume the CRO did not take any of the Bus 3 pumps to the pull-to-lock position prior to re-energizing the bus. Which of the following describes the expected response sequence upon re-energizing Bus 3?

- a. The A and B RHR pumps start 5 seconds after power is restored.
- b. The A and B RHR pumps start immediately after power is restored.
- c. The B Core Spray pump starts 10 seconds after power is restored.
- d. The B Core Spray pump starts immediately after power is restored.

Question: 22 (1.00)

During normal full power operation, the CRO is performing a core spray flow surveillance. The operator inadvertently takes the control switch for the CS-12 (pump discharge valve) to the open position. The CS-11 (pump discharge valve) is already open. What is the expected system response?

- a. CS-12 will not open with reactor pressure greater than 350 psig.
- b. CS-12 will not open due to a greater than 50 psig pressure differential across the valve.
- c. CS-12 will open and then automatically close to protect low pressure piping.
- d. CS-12 will open but will not inject with core spray pump discharge head less than reactor pressure.

Question: 23 (1.00)

Given the following conditions:

- the power supply for the SLC system at MCC-9B is open
- the unit experiences an ATWS
- SLC has been manually initiated by placing the pump control switch in SYS 1 and then in SYS 2 position (the switch remains in the SYS 2 position).

Which of the following describes the condition of the SLC system given the above conditions?

- a. Squib valve SLC 14A is open and the SLC Pump B is running.
- b. Squib valve SLC 14B is open and the SLC Pump A is running.
- c. Squib valve SLC 14A is open and the SLC Pump A is running.
- d. Squib valve SLC 14B is open and the SLC Pump B is running.

Question: 24 (1.00)

OP 2134 directs the Operators to reset a reactor scram by first placing the reset switch to the "Group 2 and 3" position then to the "Group 1 and 4" position. What would occur if the operators only action was to place the reset switch to the "Group 1 and 4" position?

- a. It would cause the vent and drain valves to close on the Scram Discharge Volume.
- b. It would direct draining of the reactor vessel to the Reactor Building Drain Sump.
- c. It would cause an inadvertent hydraulic lock in the Scram Discharge Volume piping.
- d. It would cause CRD charging water flow to be bypassed to the Reactor Building Drain Sump.

Question: 25 (1.00)

Given the following conditions:

- The plant had been operating at 100% power.
- A main turbine trip occurred.
- Reactor pressure on the transient reached 1155 psig and has returned to 980 psig.
- Reactor water level reached 105 inches and has returned to 150 inches.
- All plant systems responded as designed.

Given that the Scram Pilot Air Valves are de-energized, what is the status of the following components:

Backup Scram Valve (BSV) solenoids
Alternate Rod Insertion (ARI) valve solenoids

- a. BSV -- energized
ARI -- energized
- b. BSV -- energized
ARI -- de-energized
- c. BSV -- de-energized
ARI -- energized
- d. BSV -- de-energized
ARI -- de-energized

Question: 26 (1.00)

Which ONE of the following events is a one-hour reportable event?

- a. Loss of the Gaitronics system.
- b. Scram due to High Reactor Pressure.
- c. Inadvertent Group 3 Isolation while testing Reactor Building Ventilation Radiation Monitors.
- d. HPCI-14 (HPCI steam admission valve) found to be failed closed during monthly testing.

Question: 27 (1.00)

Given the following conditions with a reactor startup in progress:

- The Mode Switch is in STARTUP.
- All IRMs are on Range 2 with stable indication.

The CRO verified proper SRM/IRM overlap and selects the SRM A and SRM B detectors to be withdrawn from the core. As the detectors are withdrawn, the detectors indicate the following:

SRM A 1.5E3 cps

SRM B 8.5E2 cps

Which of the following describes the plant response, if any, to these conditions?

- a. No response.
- b. A half scram is generated.
- c. A rod block is generated.
- d. The Retract Permissive Interlock is deenergized.

Question: 28 (1.00)

Given the following conditions:

- APRMs are indicating 74% power.
- Reactor Thermal Power is 1179 Mwt average.
- Core Flow is 36 Mlbs/hr.
- Two Recirculations loops are in operations with a Drive flow of 14600 gpm per loop.
- Thermal Limits are: MFLPD=.75; MAPRAT=.73; MFLCPR=.84.

Which of the following describes the highest APRM flow biased setpoint allowed by Technical Specifications?

- a. Less than or equal to 71.7%
- b. Less than or equal to 77.3%
- c. Less than or equal to 83.6%
- d. Less than or equal to 88.8%

Question: 29 (1.00)

During NORMAL working hours, the SS had just made the determination the plant has entered an Unusual Event. The SS must ensure that the NRC Operations Center is notified:

- a. Immediately.
- b. As soon as possible, but not longer than 15 minutes.
- c. As soon as possible, but not longer than one hour.
- d. As soon as possible, but not longer than 4 hours.

Question: 30 (1.00)

Given the following conditions:

- Reactor is shutdown.
- RCIC is in service supporting cool down operations.
- RPV pressure is 220 psig.

Which of the following describes the effect on the RCIC System if ECCS level trip instruments (LT-2-3-72 A-D) reference legs flash to steam?

As a direct result of the d/p signal from the level instrument:

- a. RCIC 16 (Outbd Isolation) and RCIC 15 (Inbd Isolation) valves will close.
- b. RCIC 1 (trip throttle valve) will close.
- c. RCIC 131 (Steam supply valve) will close.
- d. No RCIC valves will close.

Question: 31 (1.00)

Given the following:

- The Unit has experienced a loss of all AC Power.
- RCIC automatically initiated and is injecting to the reactor vessel.
- A Steam Tunnel High Temperature Condition occurs.

Which of the following describes the expected RCIC response? (Assume no other Operator action.)

- a. No RCIC system isolation or turbine trip will occur, the system remains in service.
- b. A RCIC system isolation will occur; both the Inboard and Outboard Steam Isolation Valves (RCIC-15 and RCIC-16) close.
- c. A RCIC system isolation will occur except the Inboard Steam Isolation Valve (RCIC-15) will not close.
- d. A RCIC system isolation will occur except the Outboard Steam Isolation Valve (RCIC-16) will not close.

Question: 32 (1.00)

With a loss of DC-2C (125 vdc) and an ADS system initiation signal present, which of the following describes the response of the ADS System?

- a. Only ADS relief valves A and C will open since ADS logic A has a backup power supply.
- b. Only ADS relief valves B and D will open since ADS logic B has a backup power supply.
- c. All ADS relief valves will open since ADS logic A has a power supply.
- d. All ADS relief valves will open since ADS logic B has a power supply.

Question: 33 (1.00)

Which of the following describes the a minimum condition under which the Rx Bldg to Torus Vacuum Breakers will open?

- a. When Rx Bldg pressure exceeds the Torus pressure by 1.7 psid.
- b. When Rx Bldg pressure exceeds the Torus pressure by 0.5 psid.
- c. When the Torus pressure exceeds Rx Bldg pressure by 1.7 psid.
- d. When the Torus pressure exceeds Rx Bldg pressure by 0.5 psid.

Question: 34 (1.00)

The reactor is operating at 100% power. The following annunciators are received:

- MN STM LN RAD HI/DWNSCL (3-F-1)
- AUTO SCRAM CH A (5-K-1)
- MN STM LN RAD HI (5-K-6)

You confirm the RPS "A" half scram, but observed no PCIS valves went closed. The "C" main steam line rad monitor (PRM-17-251C) is not displaying any data and is determined to be in a tripped condition.

I&C technicians request to test the "D" main steam line rad monitor. This activity involves placing the mode switch for the rad monitor in INOP and UPSCALE TRIP. Which of the following describes the plant response if testing is allowed?

- a. A RPS "B" half scram with no PCIS Group I isolation.
- b. A RPS "B" half scram with a half Group I PCIS isolation will occur.
- c. A full scram will occur with no PCIS Group I isolation.
- d. A full scram with a full PCIS Group I isolation will occur.

Question: 35 (1.00)

A break has occurred inside containment on the nitrogen supply line to the SRVs.

Which of the following describes how manual operation of the SRVs is effected by this condition?

- a. SRV cycles are limited. More cycles are available at a high drywell pressure condition.
- b. SRV cycles are limited. Fewer cycles are available at a high drywell pressure condition.
- c. SRV cycles are unaffected because instrument air will realign automatically on lowering containment air receiver pressure.
- d. SRV cycles are unaffected because the nitrogen bottle will realign automatically on lowering containment air receiver pressure.

Question: 36 (1.00)

With power ascension in progress, the "A" RBM causes an INOP TRIP Rod Block. I&C is called and they inform you that it will take \approx 18 hours to return this channel to service. Reactor power is at 55% and thermal limits indicate that you are not operating on a limiting control rod pattern.

Which of the following is correct?

- a. You are in a T.S. required shutdown and must declare an Usual Event making reports per AP 0156.
- b. The channel may be bypassed but you must initiate insertion of operable rods and complete insertion of all operable rods in 4 hours.
- c. The channel may not be bypassed and startup must be halted until the RBM channel is repaired. Repairs must be completed within 24 hours.
- d. The channel may be bypassed and startup may continue. Ensure the "A" RBM is returned to service within 24 hours.

Question: 37 (1.00)

The plant is operating normally at 100% power when the Speed Load Changer is taken to lower and held there.

What is the effect on reactor pressure?

- a. Reactor pressure will increase. The control valves close and the bypass valves remain as-is.
- b. Reactor pressure will decrease. The control valves remain as-is and the bypass valves open.
- c. Reactor pressure will remain constant. The control valves close and the bypass valves open.
- d. Reactor pressure will remain constant. The control valves and bypass valves remain as-is.

Question: 38 (1.00)

During Shift turnover, you are informed that Vermont Yankee is operating at 100% power with one outstanding LCO:

Two days ago, Standby Gas Treatment System "A" was declared INOP due to failure of SGT-3A damper. Repair time is estimated to take two (2) more days.

Three hours into the shift, the "B" Diesel Generator is declared INOP due to a loss of the Starting Air System. Which of the following most correctly describes the actions to be taken as a result of these plant conditions?

- a. Reactor operations may continue during the succeeding seven (7) days, provided that all low pressure core cooling and containment cooling subsystems associated with the "A" Diesel Generator are demonstrated operable, and daily thereafter.
- b. Reactor operations may continue for the succeeding five (5) days, provided the "B" Standby Gas Treatment System is demonstrated operable daily.
- c. The reactor shall be in a Hot Shutdown condition within 24 hours.
- d. The reactor shall be in Hot Shutdown within 12 hours, and in Cold Shutdown within the following 24 hours.

Question: 39 (1.00)

Conditions:

- Rx power is 100%.
- Feedwater Level Control (FWLC) in three element control.
- Feedwater Flow Summer in the FWLC circuitry fails to a minimum (zero) output.

The resulting feed flow/steam flow mismatch causes actual feed flow to:

- a. Increase, and level stabilizes below the turbine trip setpoint.
- b. Decrease, recirc runs back and level stabilizes above SCRAM setpoint.
- c. Decrease, resulting in a low level reactor SCRAM.
- d. Increase, resulting in a turbine trip and reactor SCRAM.

Question: 40 (1.00)

Select the correct answer:

The SBGT system is in normal standby lineup. Which of the following describes the consequences of a total loss of air?

- a. All valves fail "AS-IS". SBGT will actuate under accident conditions.
- b. All valves fail "AS-IS". SBGT will not actuate under accident conditions.
- c. All valves fail in a position to provide a vent path. SBGT will actuate under accident conditions.
- d. All valves fail in a position to provide a vent path. SBGT will not actuate under accident conditions.

Question: 41 (1.00)

The CRO has just shutdown the B Diesel Generator (0 rpm) from the monthly surveillance test when a loss of normal power occurs. Which of the following statements describes the Diesel response to this condition? (AO has not taken any actions).

- a. The Diesel will start immediately.
- b. The Diesel will start after the stopping relay times out.
- c. The Diesel will start after the AO locally resets the fuel racks.
- d. The Diesel will start after the AO locally places the engine control to REMOTE.

Question: 42 (1.00)

Given the following:

The unit is operating at 100% power. The CRO receives an accumulator trouble alarm for a low pressure condition, for a control rod that is at position 48. An auxiliary operator is tasked to clear the alarm condition.

While the accumulator is isolated and being recharged a reactor scram occurs.

The control rod will:

- a. remain at its present position and not move.
- b. scram within Tech Spec allowable insertion time.
- c. scram at a slower than Tech Spec insertion time.
- d. drift into the full inserted position.

Question: 43 (1.00)

Given the following conditions:

- Control rod withdrawal activities for a reactor startup are in progress.
- While withdrawing control rod 26-27 one notch, the Reactor Manual Control System Master timer fails by generating a continuous withdrawal signal.

Which of the following describes the expected control rod response.

Control rod 26-27 will:

- a. Immediately receive a withdrawal block and stop moving.
- b. Immediately receive a Rod Select Block and will be deselected.
- c. Withdraw for a total of 2.0 seconds and then will receive a withdrawal block only.
- d. Withdraw for a total of 2.0 seconds and then will receive a Rod Select Block and will be deselected.

Question: 44 (1.00)

Given the following:

- Reactor power is 100%.
- The "A" recirculation pump No. 1 (inbd) seal pressure indicates 1000 psig.
- The "A" recirculation pump No. 2 (outbd) seal pressure indicates 850 psig.
- The PUMP A INNER SEAL LKG HI/LO alarm (4-C-2) annunciated.

Which of the following describes the operator's action for these parameters?

- a. Secure the affected recirculation pump MG set and close the suction valve first, then the pump discharge and bypass valves.
- b. Failure of one recirculation pump seal does not require operator action other than monitoring seal temperatures closely.
- c. Trip the affected recirculation pump and immediately close the pump discharge valve and set the speed of the running pump as directed by the SCRO..
- d. Direct the Auxiliary Operator to adjust the reactor building closed cooling water system temperature to 100°F and pressure to 75 psig.

Question: 45 (1.00)

Given the following:

- The plant is in a refueling outage.
- Fuel movement is in progress from the spent fuel pool to the RPV.
- The refuel platform operator is lowering a fuel bundle into the core when decreasing water level is noticed in the reactor cavity.
- The floor radiation levels are normal.
- All SRMs are operable.

As per OP 1101, Management of Refueling Activities and Fuel Assembly Movement, what action is required by the Refueling SRO if the assembly has been lowered half way into the core?

- a. Suspend the move, leave the bundle as-is.
- b. Suspend the move, return the fuel bundle to its original position in the spent fuel pool.
- c. Continue the move by lowering the bundle into its scheduled location in the core.
- d. Continue the move by lowering the bundle into the core but only with the concurrence of the Shift Supervisor and Reactor Engineer.

Question: 46 (1.00)

Given the following:

- Reactor is shutdown.
- Shutdown cooling valves RHR-17 and RHR-18 are open.
- OP 2124 directs the CRO to maintain reactor level greater than 185 inches.

Which of the following describes the basis for maintaining this level?

- a. Make up for the 14" inventory loss when opening RHR-17 and RHR-18.
- b. Prevent thermal stratification in the RPV upon loss of shutdown cooling.
- c. Provide minimum NPSH for the in service RHR pump.
- d. Ensure natural circulation flow in the recirculation loops.

Question: 47 (1.00)

With the Mode Switch in Startup, at 1200 on 9/5/00, the Downscale Trips for IRM Channels "A", "B", and "E" are made inoperable.

Which ONE of the following is the LATEST that one of these channels must be placed in a tripped condition?

- a. 300 on 9/5/00
- b. 1200 on 9/6/00
- c. 1200 on 9/12/00
- d. 1300 on 9/12/00

Question: 48 (1.00)

The plant has been shutdown due to a leaking SRV. RHR Loop B is in torus cooling while RHR Loop A is in shutdown cooling. A small leak causes drywell pressure to go up to 2.5 psig. Which one of the following describes the response of the RHR system?

- a. Loop A pumps trip and Loop B pumps trip.
- b. Loop A pumps trip and Loop B pumps inject into the vessel (LPCI).
- c. Loop A injects into the vessel (LPCI) and Loop B pumps trip.
- d. Loop A injects into the vessel (LPCI) and Loop B injects in the vessel (LPCI).

Question: 49 (1.00)

You are directed to initiate Drywell Spray with RHR Loop "B" 20 minutes after a LOCA. The following conditions are present:

- Drywell and Suppression Chamber pressures are 10 psig.
- RPV level is -54 inches on LT-2-3-91A/B (Shroud Level) and slowly rising.
- Both RHR Pumps A and B are injecting through the heat exchangers.

WHICH ONE of the following is required before you can open MOV-26B?

- a. Place only RHR B/D LOGIC CTMT SPRAY VLV LPCI SIG BYPASS SWITCH (Pistol Grip) in the MANUAL position.
- b. Place only the RHR B/D LOGIC CTMT SPRAY VLV SHROUD LEVEL OVRD SWITCH (Keylock) in the MANUAL OVERRIDE position.
- c. Place the RHR B/D LOGIC CTMT SPRAY VLV LPCI SIG BYPASS SWITCH (Pistol Grip) in the MANUAL position and then place the RHR B/D LOGIC CTMT SPRAY VLV SHROUD LEVEL OVRD SWITCH (Keylock) in the MANUAL OVERRIDE position.
- d. Place the RHR B/D LOGIC CTMT SPRAY VLV SHROUD LEVEL OVRD SWITCH (Keylock) in the MANUAL OVERRIDE position and then place the RHR B/D LOGIC CTMT SPRAY VLV LPCI SIG BYPASS SWITCH (Pistol Grip) in the MANUAL position.

Question: 50 (1.00)

Given the following conditions:

- Reactor power is 60%.
- The A Main Steam Line is isolated (MS 80A and MS 86A are closed).
- The D Main Steam Inboard Isolation Valve, MS 80D drifts closed.

Which of the following describes the plant response to these conditions?

- a. A full reactor scram occurs.
- b. Reactor operations continue and all RPS logic channels remain energized.
- c. Reactor operations continue, but a half scram results on the "A" side of RPS.
- d. Reactor operations continue, but a half scram results on the "B" side of RPS.

Question: 51 (1.00)

Why is MS-6, Steam Seal Regulator Inlet valve opened at 70% rated thermal power?

- a. It prevents the seal regulator unloading valve from hunting.
- b. The high pressure turbine leakage will no longer seal the turbine shafts.
- c. The low pressure turbine leakage will no longer seal the turbine shafts.
- d. The steam packing exhauster has excessive capacity for this power level.

Question: 52 (1.00)

During a reactor shutdown, why is a condensate pump secured when reactor feedpump suction pressure reaches 450 psig?

- a. It prevents lifting the feedpump suction relief valves.
- b. It prevents damage to the condensate demineralizer gaskets.
- c. It prevents overloading the condensate pump thrust bearing.
- d. It prevents condensate pump current from exceeding 190 amps.

Question: 53 (1.00)

The plant was operating at full power, when a fault occurred on Bus 8.

Which of the following is the expected plant response?

- a. A full PCIS Group I isolation occurs.
- b. A full PCIS Group II isolation occurs.
- c. A full PCIS Group III isolation occurs.
- d. A full PCIS Group V isolation occurs.

Question: 54 (1.00)

Given the following conditions:

- 120V AC Vital Manual Transfer Switch on CRP 9-8 has been placed in Alternate.
- Vital AC MG set is secured.
- The red light above the transfer switch on CRP 9-8 is illuminated on "ALTERNATE".
- The remainder of the electrical system is in a normal configuration.

Which of the below describes the Vital and Instrument AC status when MCC 9A becomes de-energized?

- a. Instrument AC is energized from MCC 8A and Vital AC is de-energized.
- b. Instrument AC is de-energized and Vital is energized from MCC 8A.
- c. Both Instrument AC and Vital AC are energized from MCC 8A.
- d. Both Instrument AC and Vital AC are de-energized.

Question: 55 (1.00)

While shutting down using Alternate Shutdown methods, Transfer Switch MTS-13-1 is placed to the EMERGENCY position. This aligns DC-2B to be powered from:

- a. 125 VDC Emergency Bus (DC-1AS).
- b. 125 VDC Control Power Bus (DC-5A).
- c. 48 VDC Emergency Bus (DC-6A).
- d. 24 VDC ECCS Bus (Panel "A").

Question: 56 (1.00)

The plant is operating at 100% power. AOG system component status is as follows:

- "A" Recombiner in OPERATE
- "B" Recombiner in MANUAL (OG-101B & 103B valves SHUT)
- "A" Dryer Skid in AUTO
- "A" Vacuum Pump in AUTO (OG-140A & 144A valves SHUT)
- "B" Vacuum Pump in AUTO

A system transient has caused these conditions to exist:

- System Inlet Pressure - 2.5 psig
- Recombiner Outlet [H₂] - 100% LEL
- Recombiner Inlet Temperature - 355°F
- "A" Dryer Skid Inlet Pressure - 2 psig

The expected system response as a result of the above conditions is:

- a. "A" Recombiner shifts to OFF, "B" Recombiner shifts to AUTO, "A" Vacuum Pump starts.
- b. "A" Recombiner shifts to STANDBY, "B" Recombiner remains in MANUAL, "B" Vacuum Pump trips.
- c. "A" Recombiner shifts to OFF, "B" Recombiner remains in MANUAL, "A" Vacuum Pump starts.
- d. "A" Recombiner shifts to STANDBY, "B" Recombiner shifts to STANDBY, "B" Vacuum Pump trips.

Question: 57 (1.00)

What is the response of Rx Bldg ventilation rad monitor "A" when you swap RPS Bus "A" to its alternate power supply?

Rx Bldg Vent Rad Monitor "A" will:

- a. deenergize and remain deenergized; NO PCIS Group III isolation will occur.
- b. deenergize and reenergize; NO PCIS Group III isolation will occur.
- c. deenergize and remain deenergized; a full PCIS Group III isolation will occur.
- d. deenergize and reenergize; a full PCIS Group III isolation will occur.

Question: 58 (1.00)

Given the following conditions:

- A loss of power to Buses 2, 4 and 9 has occurred.
- "A" Diesel Generator started and loaded.
- "B" Service Water Pump is out of service.
- "Diesel Fire Pump Trouble" alarm (K-9 on CRP 9-6) is alarming.
- "Electric Fire Pump Trouble" alarm (M-9 on CRP 9-6) is alarming.

For the given conditions:

- a. Both alarms are expected.
- b. The Diesel Fire Pump Trouble alarm is not expected.
- c. Neither alarm is expected.
- d. The Electric Fire Pump Trouble alarm is not expected.

Question: 59 (1.00)

Which of the following is the only automatic action that occurs on lowering instrument air pressure?

- a. The service air header isolates.
- b. The instrument air dryer is bypassed.
- c. The service and instrument air systems are cross-connected.
- d. The off-service scram air header pressure control valve opens.

Question: 60 (1.00)

A reactor startup is in progress and reactor power is 18%. APRMs "A" and "B" are bypassed and IRM "E" is bypassed. Which one of the following is correct for this condition?

- a. No action is required. The Technical Specification requirements for the minimum number of APRMs for RPS and Rod Blocks must be tracked but the minimum number is currently satisfied.
- b. The minimum number of APRM inputs for one of the Rod Block Trip Systems is not met. A seven day LCO must be entered and the operable rod block trip system tested immediately and daily thereafter.
- c. The minimum number of APRM inputs for one of the RPS trip systems is not met. The RPS "A" trip system must be placed in a trip condition.
- d. The minimum number of APRM inputs for one trip system of RPS and the Rod Block trips is not met. The RPS "A" trip system must be placed in a trip condition and the operable rod block trip system tested immediately and daily thereafter.

Question: 61 (1.00)

A reactor scram due to a low level condition has occurred. The ball and shear valves are open. (Assume no operator actions).

This condition is:

- a. A normal condition since the shear valves are normally open.
- b. A normal condition since the ball valves are normally open.
- c. An abnormal condition since the shear valves should be closed.
- d. An abnormal condition since the ball valves should be closed.

Question: 62 (1.00)

Given the following conditions:

- The unit is in a refueling outage.
- The Mode Selector Switch is in "Refuel".
- The Refueling Platform is over the spent fuel pool.
- A fuel bundle has been loaded on the Main Hoist and raised out of the fuel pool storage rack.

Which of the following actions would result in a rod block?

- a. The Refueling Platform operator raises the Main Hoist to the "full up" position.
- b. The Unit Reactor Operator places the Mode Selector Switch in "Startup/Hot Standby".
- c. The Refueling Platform operator moves the platform over the reactor vessel.
- d. The Unit Reactor Operator selects, but does NOT withdraw, a single control rod.

Question: 63 (1.00)

You are the SS on shift and the plant is operating at 100% power, when indications/alarms detect an AS-2 battery output breaker tripped condition. Subsequent investigation by electrical maintenance reveals that the breaker will not remain closed. In accordance with Technical Specifications which one of the below listed actions is correct?

- a. Continued reactor operation is permissible if DG-1-1A control power is shifted to Station Battery B-1.
- b. Continued reactor operation is permissible if DG-1-1A control power is shifted to Station Battery B-1 and a 2 hour fire watch is established.
- c. Battery AS-2 must be declared inoperable and the reactor must be shutdown in 24 hours.
- d. No action is required because Battery AS-2 does not have a limiting condition for operation.

Question: 64 (1.00)

A common mode failure mechanism with Service Water pressure switches PS-104-120A/B/C/D has been discovered. The Service Water System Engineer reports that the automatic isolation function of the SW Non-Essential Cooling Loop provided by SW-19A/B and SW 20 will not function if required. The engineer reports that replacement of the defective pressure switches will take at least 36 hours.

Based on this information, what, if any action, is required?

- a. The SW system is inoperable. An orderly shutdown shall be initiated and the reactor shall be in cold shutdown within the next 24 hours.
- b. The SW system is inoperable. Reactor operation is permissible only for the next 7 days unless the auto isolation function is made operable.
- c. The SW system can still be considered operable if the Non-Essential Cooling Loop is manually isolated. Continued reactor operation is permissible provided SW-19A/B and SW-20 are closed and remain closed.
- d. The SW System is still operable because the common failure mechanism only affects isolation of the Non-Essential Cooling Loop.

Question: 65 (1.00)

Given the following conditions:

- Reactor power is 100%.
- Main Generator Load Reject occurs causing a reactor scram.

Which of the following describes the plant parameter response to the Load Rejection immediately prior to the scram?

- a. Reactor pressure decreases - reactor water level decreases - reactor power decreases.
- b. Reactor pressure decreases - reactor water level increases - reactor power increases.
- c. Reactor pressure increases - reactor water level decreases - reactor power increases.
- d. Reactor pressure increases - reactor water level increases - reactor power decreases.

Question: 66 (1.00)

A manual reactor scram is inserted at 100% power. Immediately following the scram, reactor water level will initially:

- a. lower due to collapse of voids in the reactor vessel.
- b. rise due to the effect of three element reactor level control.
- c. lower due to excessive void formation in the downcomer region.
- d. rise due to the in rush of water from the downcomer region to the core region.

Question: 67 (1.00)

Given the following conditions:

- Reactor power - 100%.
- RX PRESS HI (5-E-7) annunciated.
- Reactor pressure indicates 1032 psig and trending upward.
- The manual pressure regulator (MPR) was in control at the time of the event.
- The electric pressure regulator (EPR) is available (i.e., it is not in the "CUTOOUT" position).

Which of the following statements describes the immediate operator action?

- a. Control reactor pressure with bypass valve bypass jack.
- b. Take manual control of and lower recirculation flow, as necessary.
- c. Take manual control of and lower the EPR setpoint, as necessary.
- d. Insert a manual reactor scram.

Question: 68 (1.00)

The plant is operating at 100% power with the "B" Reactor Recirculation Pump scoop tube locked when a reactor scram occurs.

Which ONE of the following actions are REQUIRED?

- a. Direct a licensed operator to manually position the "B" Reactor Recirculation MG set scoop tube to minimum speed.
- b. Direct any member of the operating crew to manually position the "B" Reactor Recirculation MG set scoop tube to minimum speed.
- c. Unlock the scoop tube, if possible, then run the "B" Reactor Recirculation pump to minimum speed.
- d. Trip the "B" Reactor Recirculation Generator Set.

Question: 69 (1.00)

The plant has experienced a LOCA with fuel failure. You are currently in the SAGs and have direction to vent the drywell. Which one of the following vent paths will both vent the drywell and minimize radioactive releases? (Assume each vent path passes identical CFM.)

- a. Open AC-7B Torus vent and vent through the SGT.
- b. Open AC-7A Drywell vent and vent through the SGT.
- c. Open AC-7B Torus vent and vent through Rx Bldg Exhaust.
- d. Open AC-7A Drywell vent and vent through Rx Bldg Exhaust.

Question: 70 (1.00)

A plant transient occurs resulting in a reactor scram and appropriate PCIS isolations. The following conditions exist:

- RPV level is 155 and steady.
- Torus sprays are in service.
- Torus venting using CAD is in progress.
- Drywell pressure is 15 psig and steady.
- Drywell temperature is 250 degrees F. and increasing.
- Torus pressure is 14 psig and steady.
- Torus level is 11 feet.
- Drywell and Torus H2 are both at 0.4%.

In accordance with EOPs, WHICH ONE of the following actions is correct?

- a. Initiate drywell sprays
- b. Execute RPV-ED
- c. Restart drywell cooling
- d. Secure venting the torus via CAD

Question: 71 (1.00)

Given the following event:

- The main turbine is tripped.
- Reactor power is 60%.
- MSIVs are closed.

As per EOP-2, ATWS, which of the following describes a required action and the reason for it?

- a. Stabilize RPV pressure by manually opening safety relief valves to minimize power fluctuations.
- b. Reduce RPV pressure with turbine bypass valves to minimize torus heatup through HPCI operation.
- c. Stabilize RPV level with RCIC to prevent automatic initiation of LPCI pumps.
- d. Reduce RPV level with reactor water cleanup to letdown water to the main condenser.

Question: 72 (1.00)

A full power ATWS occurred which caused excessive heat input to the Torus and resulted in a Torus leak. The following conditions currently exist:

- Main Condenser is available.
- Six rods are stuck full out, all other rods are fully inserted.
- Reactor pressure: 950 psig.
- Torus temperature: 190 degrees F. and steady.
- Torus level 11 ft. and dropping.

Determine which of the following actions are required by EOPs as Torus level drops from 11 ft. to 10 ft.

- a. Perform an Emergency Blowdown using EOP-5.
- b. Perform an Emergency Blowdown using Bypass valves.
- c. Depressurize to 900 psig.
- d. Depressurize to 450 psig.

Question: 73 (1.00)

The plant is operating at power when a spurious Group I isolation occurs.

- All control rods remain at their original positions.
- APRMs indicate approximately 96% power.
- All 4 SRVs have opened automatically and RPV pressure is > 1200 psig.
- Core flow is 45 mlb/hr.

The CRO attempts a manual scram which fails to insert control rods and scram air header pressure remains at 75 psig.

Without direction, the CRO must immediately:

- a. Inject boron.
- b. Drive control rods.
- c. Initiate ARI/RPT.
- d. Lower RPV water level.

Question: 74 (1.00)

A LOCA has occurred and the following conditions exist:

- Reactor pressure is 400 psig
- Reactor is shutdown
- Drywell pressure is 8.5 psig
- Drywell temperature is 270 degrees F.
- Torus temperature is 100 degrees F.
- Instrument reference leg temperatures are 310 degrees F.

WHICH ONE of the following instruments would be a reliable reactor vessel level indication under the listed conditions?

- a. LT-57A indicates 79 inches.
- b. LT-57B indicates 80 inches.
- c. LT-68A indicates 81 inches.
- d. LT-68B indicates 83 inches.

Question: 75 (1.00)

Which of the following resulting combinations of reactor power and pressure indicate a violation of a Safety Limit?

- a. Reactor Power -- 22%
Reactor Pressure -- 765 psig
- b. Reactor Power -- 27%
Reactor Pressure -- 775 psig
- c. Reactor Power -- 30%
Reactor Pressure -- 800 psig
- d. Reactor Power -- 35%
Reactor Pressure -- 815 psig

Question: 76 (1.00)

Which set of conditions assures adequate core cooling?

- a. CS "A": 0 gpm
CS "B": 1650 gpm
RPV level: +6" steady
- b. CS "A": 2000 gpm
CS "B": 1500 gpm
RPV level: -40" steady
- c. CS "A": 3100 gpm
CS "B": 0 gpm
RPV level: -10" steady
- d. CS "A": 3500 gpm
CS "B": 3500 gpm
RPV level: -65" steady

Question: 77 (1.00)

Given the following conditions:

- ATWS has occurred, the reactor is not shutdown.
- Reactor power was at 100%.
- A complete loss of circulating water has occurred requiring a scram.
- Recirculation flow has been reduced to minimum.
- The mode switch is in SHUTDOWN.
- Torus temperature is 112°F.

For these conditions, what parameter is the operator required to use to determine if injection of the Standby Liquid Control is immediately required by assessing which of the following?

- a. The Full Core Display.
- b. APRM power levels.
- c. Torus Temperature.
- d. The RPS group logic white lights.

Question: 78 (1.00)

A plant startup is in progress with the plant at 10% power when the "A" recirc pump trips. The A recirc discharge valve (RV-53A) is shut by the CRO. Total jet pump flow as indicated on DPR/FR-2-3-91 is to the left of the natural circulation line on the power to flow map.

Which of the following describes reason for this indication?

- a. A jet pump mixer has been displaced.
- b. The jet pump flow instruments are inaccurate at low flows.
- c. The reverse flow summer is subtracting positive flow through the idle loop jet pumps.
- d. The recirculation flow comparator is compensating for the natural circulation in the idle loop.

Question: 79 (1.00)

The following conditions exist:

- Main condenser backpressure: 5.4" Hg and rising rapidly.
- Circ water in OPEN cycle.
- CRO is reducing Reactor Power with recirc flow at 9%/min.
- Annunciator 9-5-K-8, "STOP/CTRL VLV FAST CLOSURE BYP" is clear.
- TB AO reports visible damage to the LP turbine exhaust boot and the sound of air rushing through.

The SCRO directs the crew to transfer station loads, scram the reactor, then trip the turbine. These actions are required because:

- a. Turbine blade damage may result from excessive exhaust pressure.
- b. A group 1 isolation can be avoided, preserving the main condenser as a heat sink.
- c. The resulting backpressure induced vibration could cause turbine shaft seal failure.
- d. An automatic turbine trip due to low vacuum will NOT cause a scram in this condition.

Question: 80 (1.00)

A loss of offsite power has occurred and EDG "A" and "B" have failed to start. Busses 1, 2, 3, 4 and 5 are de-energized. All service water pumps have been placed in STOP, then NORMAL. All ECCS pumps are in PULL-TO-LOCK.

The next immediate operator action is to:

- a. Minimize DC loads on station batteries.
- b. Place all reactor feed pumps in PULL-TO-LOCK.
- c. Direct an AO to attempt a local start of EDG "B".
- d. Attempt to energize Bus 3 or 4 from the Vernon Tie.

Question: 81 (1.00)

Given the following conditions:

- Reactor operating at 100% power.
- A complete loss of DC-1 occurs.
- The "A" Recirc Drive Motor amps are pegged high.
- Reactor water level is steady.

What action is required concerning the Reactor Recirc system?

- a. Trip the "A" Recirc MG Drive Breaker locally.
- b. Insert a Manual Reactor Scram.
- c. Trip the "A" Recirc MG DC Lube Oil Pump.
- d. Trip the "A" Reactor Feedwater Pump immediately.

Question: 82 (1.00)

The reactor is operating at 100% power, when the controlling reactor level instrument fails downscale. Which of the following statements describes the correct plant response and operator action?

- a. Reactor water level will lower. The operator shall immediately transfer to Single-Element feedwater control.
- b. Reactor water level will lower. The operator shall immediately transfer the reactor vessel feedwater Master Controller to Manual.
- c. Reactor water level will rise. The operator shall immediately transfer to Single-Element feedwater control.
- d. Reactor water level will rise. The operator shall immediately transfer the reactor vessel feedwater Master Controller to Manual.

Question: 83 (1.00)

A loss of drywell cooling results in a drywell pressure reaching 2.6 psig.

WHICH of the following describes EDG, RCIC, and RWCU response?

- a. EDGs - running and loaded
RCIC - running and injecting
RWCU - pumps tripped
- b. EDGs - running and NOT loaded
RCIC - not affected
RWCU - not affected
- c. EDGs - running and loaded
RCIC - not affected
RWCU - pumps tripped
- d. EDGs - running and NOT loaded
RCIC - running and injecting
RWCU - not affected

Question: 84 (1.00)

Given the following conditions:

- Torus water level is 8 feet.
- Torus water temperature is 180°F.
- Reactor pressure is 700 psig.

Under these conditions, RPV Emergency Depressurization is:

- a. Not required since primary containment limits are not exceeded.
- b. Required to ensure the energy released during an RPV blowdown can be accepted.
- c. Required since the downcomers are now exhausting to the torus free air space.
- d. Prohibited since the SRV tail pipes are now exhausting to the torus free air space.

Question: 85 (1.00)

Given the following conditions:

- A transient occurred requiring Control Room evacuation.
- All required immediate actions per OP3126, Shutdown Using Alternate Shutdown Methods were completed.
- RCIC is being operated for reactor level control from the RCIC Alternate Shutdown Panel (ASP).
- The RCIC turbine coasted to a stop with NO apparent reason indicated at the ASP.

Which of the following describes what occurred to the RCIC system and the system's current status?

- a. A RCIC high level turbine trip setpoint has been exceeded that cannot be reset preventing RCIC from being restarted from the ASP.
- b. A RCIC turbine trip setpoint has been exceeded that can be locally reset allowing RCIC to be restarted from the ASP.
- c. A RCIC system isolation has been exceeded and RCIC is no longer available for reactor water level control from the ASP.
- d. A RCIC system isolation setpoint has been exceeded with RCIC restart possible once the isolation signal is reset from the ASP.

Question: 86 (1.00)

Due to loss of RBCCW, alternate cooling to the RHR pump coolers is being established.

Which of the following describes the operational concern when the operator opens valves SW-36 A(B), SW Loop A(B) X-ties to Alternate Cooling?

- a. RHR SW pump runout may occur.
- b. The RBCCW piping may be overpressurized.
- c. Cross-system contamination from the RBCCW to the RHR SW system will occur.
- d. The RBCCW surge tank will fill and overflow.

Question: 87 (1.00)

ON 3146, Low Instrument/Scram Air Header Pressure, requires a manual scram if scram air header pressure drops below 55 psig and cannot be restored.

With the plant at full power, which of the following describes the basis for the scram?

- a. Below 55 psig, accumulator pressure is no longer sufficient to ensure that the control rod would meet its required insertion time.
- b. The scram eliminates the undesirable effects of the irregular rod patterns from random rod insertion.
- c. SDV in-leakage from the drifting open of the scram inlet and outlet valves would create a hydraulic lock, preventing a scram.
- d. The SDV drain valves will fail open and cause the reactor building to become contaminated in the event of a scram.

Question: 88 (1.00)

The plant is operating at 70% reactor power when the "A" outboard MSIV fails closed.

Which of the following describes the response of the reactor? (Assume no operator action is taken).

- a. Reactor power will decrease and stabilize at a lower power.
RPV water level will decrease and then return to a normal level.
- b. Reactor power will decrease and stabilize at a lower power.
RPV water level will increase and then return to a normal level.
- c. Reactor power will increase and stabilize at a higher power.
RPV water level will decrease and then return to a normal level.
- d. Reactor power will increase and stabilize at a higher power.
RPV water level will increase and then return to a normal level.

Question: 89 (1.00)

Given the following plant conditions:

- A reactor startup is in progress.
- Reactor pressure is at 800 psig.
- Both CRD pumps fail.
- Two CRD accumulators are in an alarm condition for low nitrogen pressure.

Which of the following statements describes the significance of 800 psig reactor pressure in this condition?

- a. Below 800 psig, the core pressure drop is such that design peaking factors are conservative enough to ensure thermal power limits will not be exceeded with slower rod insertions times.
- b. Below 800 psig, those rods with inoperable accumulators will be able to meet required scram insertion times due to the action of reactor pressure.
- c. Above 800 psig, the core pressure drop is such that design peaking factors are conservative enough to ensure thermal power limits will not be exceeded with slower rod insertions times.
- d. Above 800 psig, those rods with inoperable accumulators will be able to meet required scram insertion times due to the action of reactor pressure.

Question: 90 (1.00)

While performing the Torus Temperature Control leg of EOP-3, Primary Containment Control, the operator is directed to enter EOP-1, RPV Control, and execute concurrently before torus temperature reaches 110°F.

Which of the following describes the reason for entering and performing EOP-1 concurrently without a specific EOP-1 entry condition being met?

- a. It ensures that torus temperature will never exceed the Heat Capacity Temperature Limit.
- b. It ensures that a RHR pump is dedicated to torus cooling regardless of actual reactor water level.
- c. It directs a reactor scram and removes the main source of potential energy addition to the torus before conditions warrant injection of boron.
- d. It provides direction for reactor pressure control should torus temperature reach the point requiring emergency depressurization with the Turbine Bypass Valves.

Question: 91 (1.00)

A loss of all RPV level indication due to high drywell temperature has occurred. The reactor was successfully scrammed at 0950. The following conditions were satisfied at 1120 hours:

- 4 SRVs were manually opened.
- RPV pressure - steady at 120 psig.
- Torus water level - 12.7 feet.
- Torus pressure - 2 psig and stable.
- DW pressure - 2 psig and stable.
- DW temperature - 195 degrees F. and stable.
- Core spray pump "B" injecting.
- RPV water level instrumentation is operational.

For these conditions, injection should be maintained to restore RPV level indication until:

- a. 1145 hours
- b. 1154 hours
- c. 1223 hours
- d. 1250 hours

Question: 92 (1.00)

A LOCA has occurred and EOP-3, "Primary Containment Control", has been entered. The SCRO is about to order the CRO to spray the drywell but first asks the CRO to verify torus level is below 23 ft. The concern for this is that if spray is initiated when torus level is above 23 ft.:

- a. Torus level will cause RHR to cavitate.
- b. Torus spray header will be submerged.
- c. Torus capacity is insufficient to accept spray water.
- d. Torus-Drywell vacuum breakers will be submerged.

Question: 93 (1.00)

The following plant conditions exist:

- The plant is operating at 100 percent power with all systems normal.
- An armed, violent intruder has gained access to the reactor building.
- An explosive device has detonated causing a 6 inch hole in the bottom of the torus.
- Torus water level is 7.0' and lowering at 2 inches per minute.
- Emergency Make-Up efforts are hindered by the intruder threat.
- The reactor is manually scrammed.
- Control rod 14-31 is stuck at position 48.
- Control rod 42-27 is stuck at position 02.

Assuming a constant inventory loss rate, which on of the following actions must you direct IAW EOPs?

- a. Emergency depressurize open all SRVs
- b. Rapidly depressurize using the Turbine Bypass Valves
- c. Wait for torus level to drop below 5.5' then open all SRVs
- d. Wait for torus level to drop below 5.5' then rapidly depressurize using the turbine bypass valves

Question: 94 (1.00)

WHICH ONE of the following conditions requires RPV-ED in accordance with EOPs?

Assume a primary system is discharging into the areas listed.

- a. NE corner room - 232' area temperature is 195 deg. F.
NE corner room - 213' area temperature is 192 deg. F.
- b. TIP room radiation level - RB 252' North is 1 rem/hr.
Torus catwalk radiation level is 1.2 rem/hr
- c. Torus room SW area - 213' temperature is 240 degrees F.
Torus room NW area - 213' temperature is 270 degrees F.
- d. Elevator entrance radiation level - RB 318' NW is 800 mr/hr.
RWCU precoat radiation level - RB 318' NW is 1.2 mr/hr.

Question: 95 (1.00)

With a Reactor Building Vent Exhaust greater than 14 mRem/hr present, EOP-4, Secondary Containment Control, directs the operator to confirm or initiate Reactor Building HVAC Isolation and a Standby Gas Treatment System startup.

This action will ensure that:

- a. A processed and controlled ground release of activity is provided.
- b. A processed and controlled elevated release of the activity is provided.
- c. The Reactor Building atmosphere is contained at a positive pressure until it can be processed and released.
- d. Both the primary and secondary containments are maintained at a slightly negative pressure.

Question: 96 (1.00)

Unit conditions are as follows:

- A plant shutdown is in progress due to high coolant activity.
- HVAC exhaust radiation level is 10 mRem/hr and steady.
- The noble gas discharge to areas at the site boundary results in dose rates of 4,500 mRem/year to the total body.

WHICH ONE of the following identifies the minimum Emergency Classification Level (EAL) Classification and the requirement to enter EOP-4?

	<u>EAL</u>	<u>EOP-4 Entry Required</u>
a.	Unusual Event	Yes
b.	Unusual Event	No
c.	Alert	Yes
d.	Alert	No

Question: 97 (1.00)

Given the following conditions:

- The reactor is in COLD SHUTDOWN
- A loss of shutdown cooling occurred

Based on the direction in ON-3156, Loss of Shutdown Cooling, the SCRO directs a feed and bleed. RWCU letdown is established as the bleed method.

What system shall be directed as the feed method in accordance with ON 3156?

- a. Injection by using CRD pumps.
- b. Injection by using the CS pumps.
- c. Condensate Transfer through the LPCI system.
- d. Condensate and Feed using the condensate pumps.

Question: 98 (1.00)

The unit is in a refueling outage with core alterations in progress. As the CRO, you note the following indications:

- "Rx Bldg/Refuel Flr CH B Rad Hi" annunciator 9-5-J-1 is lit.
- The reactor building ventilation system isolates.
- The standby gas treatment system initiated.

You shall immediately perform which one of the following:

- a. Determine if the alarm is a distraction (nuisance alarm) due to a transitory event.
- b. Announce via the Gaitronics to evacuate the refuel floor.
- c. Notify Chemistry and Rad. Protection to commence sampling and surveying to determined the source of the activity.
- d. Monitor the radiation instrument to determine if the alarm is due to downscale or high radiation.

Question: 99 (1.00)

A leak into the Secondary Containment has resulted in entry into EOP-4, Secondary Containment Control. Two area temperatures have exceeded their Maximum Safe Operating Limit. As a result, the SCRO has directed an RPV-ED.

What is the basis for performing an RPV-ED?

- a. Precludes further area temperature increases, which will prevent operator access required for safe shutdown of the plant.
- b. Precludes further area temperature increases, which will pose a threat to environmental qualifications of equipment required for safe shutdown.
- c. Rejects heat to the main condenser in preference to the secondary containment.
- d. Rejects heat to the main condenser in preference to the primary containment.

Question: 100 (1.00)

A fire protection header rupture has resulted in 5 inches of water in the RCIC room.

Entry into EOP-4 is:

- a. Required immediately.
- b. Required when water level reaches 12 inches.
- c. Not required because only one area was affected.
- d. Not required because the Fire Protection System is not a primary system.

VERMONT YANKEE - SRO EXAM - ANSWER KEY - 09/00

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

VERMONT YANKEE - SRO EXAM - ANSWER KEY - 09/00

QUES	ANS					QUES	ANS				
51.	B					76.	A				
52.	B					77.	C				
53.	C					78.	C				
54.	A					79.	A				
55.	A					80.	D				
56.	C					81.	B				
57.	D					82.	D				
58.	B					83.	B				
59.	A					84.	B				
60.	C					85.	B				
61.	D					86.	B				
62.	C					87.	B				
63.	B					88.	D				
64.	A					89.	D				
65.	C					90.	C				
66.	A					91.	B				
67.	C					92.	D				
68.	D					93.	A				
69.	A					94.	B				
70.	A					95.	B				
71.	A					96.	B				
72.	D					97.	A				
73.	C					98.	B				
74.	D					99.	B				
75.	B					100.	A				

REFERENCE MATERIAL PROVIDED TO CANDIDATES FOR WRITTEN EXAM

SRO CANDIDATES:

- Set of EOPs without entry conditions.
- TSs section 3 only.
- Technical Requirements Manual.
- AP 3125, Appendix "A" & "B".

RO Candidates:

- HCTL curve

Attachment 2

RO WRITTEN EXAM W/ANSWER KEY

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

APPLICANT'S NAME: _____

FACILITY: _____ VERMONT YANKEE _____

REACTOR TYPE: _____ BWR-GE _____

DATE ADMINISTERED: _____

INSTRUCTIONS TO APPLICANT:

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 80.00%. Examination papers will be picked up five (5) hours after the examination starts.

TEST VALUE	APPLICANT'S SCORE	FINAL GRADE %
100.00		

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

Applicant's Signature

REACTOR OPERATOR ANSWER SHEET

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 ___

REACTOR OPERATOR ANSWER SHEET

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 ____

ANSWER SHEET

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 will result in denial of your application and/or action against your license.
2. After you complete the examination, 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.
3. To pass the examination, you must achieve a grade of 80.00% or greater; grades will not be rounded up to achieve a passing score. Every question is worth one point.
4. There is a nominal time limit of five (5) hours for completing the examination; extensions will be granted if anyone needs more time to complete the exam.
5. You may bring pencils, pens, and calculators into the examination room. Use black ink to ensure legible copies; dark pencil should be used only if necessary to facilitate machine grading.
6. Print your name in the blank provided on the examination cover sheet and each answer sheet.
7. Mark your answers on the answer sheet provided and do not leave any question blank. Use only the paper provided and do not write on the back side of the pages. If you are using ink and decide to change your answer draw a single line through the error, enter the desired answer, and initial the change.
8. If you have any questions concerning the intent of the initial conditions of a question, do not hesitate asking them before answering the question. Ask questions of the facility instructor/proctor only. When answering a question, do not make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the questions so states or the alarm is expected to activate as a result of the conditions that are stated in the question. Finally, answer all questions based on actual plant operation, procedures, and references. If you believe that the answer would be different based on simulator operation or references, you should answer the question based on the actual plant.
9. Restroom trips are permitted but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

10. When you complete the examination, assemble a package including the examination questions, examination aids and answer sheets and scrap paper and give it to the exam proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination. Scrap paper will be disposed of immediately after the examination.
11. After you have turned in your examination, leave the examination area as defined by the proctor. If you are found in this area while the examination is still in progress, your license may be denied or revoked.
12. Do you have any questions?

Question: 1 (1.00)

The Operations Center is not manned. As per AP 0151, Responsibilities and Authorities of Operations Department Personnel, which of the following individuals has the Control Authority in all matters relating to switching, tagging and de-energizing of equipment.

- a. Operations Superintendent
- b. Control Room Operator
- c. Supervisory Control Room Supervisor
- d. Shift Engineer

Question: 2 (1.00)

A switchman applying a Tagging Order to allow maintenance to be performed on the supply steam drain trap in the High Pressure Coolant Injection System, notes that the downstream air-operated condensate drain flow control valves, FCV-42 and FCV-43, are being used as boundary valves.

As per AP 0140, VY Local Control Switching Rules, use of air-operated valves as a boundary valve is permitted only if:

- a. the air-operated valve is gagged closed and air supply valve tagged open.
- b. there is two-valve protection.
- c. the valve is tagged in the fail position.
- d. the switchman remains within line of sight of the valves after placing the valves in the desired position.

Question: 3 (1.00)

An operator is in direct control of venting operations for the "A" Residual Heat Removal system. The vent valve is left in the "closed" position at the completion of the task. As per AP-0155, Current System Valve and Breaker Lineup and Identification, the operator:

- a. needs to do nothing more, he has completed the activity and is able to proceed to another task.
- b. needs to enter the vent valve's change of position during the task into the Current Systems Lineup Book, maintained in the control room.
- c. needs to document the component's condition in a Lineup Deviation Form.
- d. needs to have a second individual perform an Independent Verification of the valve's position.

Question: 4 (1.00)

While performing a valve lineup, the independent verifier is observing the first checker's component manipulation. The reason for the independent verifier's action is the first checker is checking:

- a. a throttle valve.
- b. a drain valve in an area with background radiation levels at .010 rem/hr.
- c. a locked damper.
- d. a door to a high radiation area.

Question: 5 (1.00)

Given the following conditions:

- An operator returns from a 7-day vacation on January 6.
- The operator stands 3 normal 12-hour shifts prior to becoming ill
- The operator returns to work after his extended illness on April 1

Per 10 CFR 55, which of the following describes what the operator must do, in part, to comply with the conditions of his license?

- a. Stand a minimum of 2 shifts prior to April 6.
- b. Stand a minimum of 5 shifts prior to April 6.
- c. Completes at least 40 hours on shift time in the calendar quarter.
- d. Complete a minimum of 40 hours of shift function under instruction.

Question: 6 (1.00)

Which of the following are activated on an ALERT?

- OSC - Operations Support Center
- TSC - Technical Support Center
- EOF - Emergency Support Center

- a. TSC only
- b. TSC and OSC only
- c. TSC and EOF only
- d. TSC and OSC and EOF

Question: 7 (1.00)

A plant transient has required the crew to scram the unit from 75% power. The following current conditions exist:

- All control rods are inserted.
- Reactor pressure initially dropped to 940 psig, but has stabilized at approximately 1000 psig.
- HPCI auto started and is injecting to the reactor vessel.
- Reactor level is +135" increasing.
- Suppression pool temperature is 89°F increasing.

Which of the following procedures must be entered?

- a. OT-3100 only
- b. OT-3100 and EOP-1
- c. OT-3100 and EOP-2
- d. EOP-1 and EOP-2

Question: 8 (1.00)

WHICH ONE of the following describes the effects on the MSIVs and SBT of a continuing decrease in instrument air header pressure and reactor water level is at 125 inches?

- a. Outboard MSIVs close
SBT valves remain in normal line up
- b. Inboard MSIVs close
SBT valves line up for initiation
- c. Outboard MSIVs close
SBT valves line up for initiation
- d. Inboard MSIVs close
SBT valves remain in normal line up

Question: 9 (1.00)

Given the following:

- The plant is in a refueling outage. All SRMs are operable.
- Fuel movement is in progress from the spent fuel pool to the RPV.
- The refuel platform operator is lowering a fuel bundle into the core when the control room operator notes that SRM counts double in the core quadrant opposite the one in which the fuel is being loaded .

As per OP 1101, Management of Refueling Activities and Fuel Assembly Movement, what action is required, if any, by the control room operator if the assembly has been lowered half way into the core?

- a. No action is required continue lowering the bundle into its scheduled location in the core.
- b. Verify count rates in the other three SRM channels are normal and contact the Reactor Engineer for guidance.
- c. Notify the Shift supervisor and refuel floor SRO immediately and contact the Reactor Engineer for guidance.
- d. Notify an SRO immediately and contact the Reactor Engineer for guidance.

Question: 10 (1.00)

A fully qualified VY radiation worker with all previous exposure history on file has received 2550 mRem through the month of July 2000.

Which of the following is the maximum remaining Total Effective Dose Equivalent (TEDE) exposure this individual is allowed to receive without exceeding the VY administrative limit for the remainder of the year?

- a. 0.45 Rem
- b. 1.55 Rem
- c. 1.95 Rem
- d. 2.45 Rem

Question: 11 (1.00)

A mechanical technician, assigned to repair a safety-related check valve in a high radiation area, will exceed the annual VY radiation exposure administrative limits in order to complete the task.

As per AP 0506, Personnel Monitoring, what two individuals are required to approve this request?

- a. Maintenance Supervisor and Radiation Protection Supervisor.
- b. Maintenance Supervisor and Radiation Protection Manager
- c. Plant Manager and Radiation Protection Supervisor.
- d. Plant Manager and Radiation Protection Manager

Question: 12 (1.00)

Given the following conditions:

- A scheduled surveillance is required to be performed on a system in a radiation area.
- All radiological precautions have been taken and a pre-evolution brief has been completed.

Using the As Low As Reasonably Achievable (ALARA) guidelines, which of the following is the PREFERRED method for completing this surveillance? (Consider only the personnel aspects of this surveillance.)

- a. One individual installing shielding in a 90 mR/hr area for 30 minutes then performing the surveillance in a 9 mR/hr area for 60 minutes.
- b. One individual performing the surveillance in a 90 mR/hr area for 60 minutes.
- c. Two individuals installing shielding in a 90 mR/hr area for 15 minutes then both perform the surveillance in a 9 mR/hr for 35 minutes.
- d. Two individuals performing the surveillance in a 90 mR/hr area for 35 minutes.

Question: 13 (1.00)

Given the following conditions:

- A plant transient occurred at VY at 1415 resulting in an Unusual Event being declared at 1425.
- While completing the Unusual Event Notification form, an Alert was declared at 1435 for an unrelated event.

The State and Local Agencies shall be notified of the Alert no later than:

- a. 1440
- b. 1450
- c. 1515
- d. 1535

Question: 14 (1.00)

A reactor scram due to a high drywell condition has occurred. All systems and components responded appropriately to the scram. Which of the following describes the state of the selected components?

- a. RPS Scram Solenoids deenergized, Backup Scram Solenoids deenergized, ARI/RPT Solenoids deenergized, SDV Vent and Drain Valve Solenoids deenergized
- b. RPS Scram Solenoids deenergized, Backup Scram Solenoids energized, ARI/RPT Solenoids deenergized, SDV Vent and Drain Valve Solenoids deenergized
- c. RPS Scram Solenoids energized, Backup Scram Solenoids energized, ARI/RPT Solenoids energized, SDV Vent and Drain Valve Solenoids energized
- d. RPS Scram Solenoids energized, Backup Scram Solenoids deenergized, ARI/RPT Solenoids energized, SDV Vent and Drain Valve Solenoids energized

Question: 15 (1.00)

A brief rod insert signal is initially applied to the Control Rod Drive Mechanism during a withdrawal sequence in order to:

- a. pressurize the underside of the collet piston forcing and holding the collet fingers away from the index tube.
- b. to provide cooling water flow through the insert port and through the cooling water orifice between the thermal sleeve and outer cylinder.
- c. to reposition the ball check valve to direct drive pressure to the top of the drive piston to force it downward.
- d. lift the index tube 2-3 inches in order to remove the weight of the rod from the collet fingers.

Question: 16 (1.00)

Given the following conditions:

- Reactor power is 50%
- Core flow is 27.5 Milbm/hr
- Feedwater flow is 2 Milbm/hr
- Reactor level is +160 inches
- Turbine stop valve testing is in-progress

A malfunction in the turbine stop valve test circuitry results in the closing of the turbine stop valves.

Which of the following describes the plant response to this malfunction? (Assume no operator action).

- a. The reactor scrams on high neutron level.
- b. The reactor scrams on high pressure.
- c. The reactor scrams on turbine stop valve position.
- d. The reactor scrams on generator load reject.

Question: 17 (1.00)

Given the following conditions:

- Reactor level is +70 inches and falling.
- Reactor pressure 400 psig is decreasing slowly.
- Cooldown rate is 100°F.
- Drywell Pressure is 2.8 psig..
- the RHR system is running, but the injection valves (RHR-27A/B) are closed.
- the HPCI/RCIC systems are unavailable.
- the reactor feedwater pumps have tripped.

As the CRO you are directed to maintain reactor water level. Your attempts to open the RHR-27A are unsuccessful. Which of the following statements describes what your next actions should be?

- a. Open the RHR-27B injection valve.
- b. Perform an emergency depressurization.
- c. Open main steam bypass valves to reduce reactor pressure.
- d. Monitor reactor pressure until it is less than 350 psig then verify RHR-27A/B opens.

Question: 18 (1.00)

Given the following:

- Reactor was scrammed from 100% due to a total loss of feedwater transient.
- Reactor level dropped to 77 inches and then rapidly increased to the normal operating range.

The SCRO directs the CRO to secure the A Loop of RHR. The CRO takes the control switch for RHR injection valve (RHR 27A) to close; however, the valve did not remain closed (valve closed then reopened). In order for the 27A valve to close the CRO must first:

- a. Place the RHRSW A&C LPCI AUTOSTOP OVERRIDE SWITCH to the AUTO position.
- b. Place the UPS FDR BLOCK KEYLOCK SWITCH to the NORMAL position.
- c. Reset the RHR A/C LOGIC LPCI/RECIRC VALVE RESET.
- d. Reset the A/C LOGIC CONTAINMENT SPRAY VALVE AUTO SIGNAL RESET.

Question: 19 (1.00)

The reactor automatically scrammed due to low reactor water level. While the HPCI system was injecting to raise reactor level, the system isolates on a valid isolation signal. As the CRO, you note the HPCI-25, Min Flow Valve, remains open. As per OP 2120, HPCI System, you close the valve. What is the basis for this action?

- a. To prevent pump run-out during subsequent automatic restart.
- b. To ensure containment isolation with a valid isolation signal.
- c. To prevent siphoning torus water into the HPCI piping .
- d. To prevent the inadvertent draining of the CST to the torus.

Question: 20 (1.00)

When manually starting the HPCI system, the turbine steam supply valve, HPCI-14, is opened prior to starting the auxiliary oil pump.

Which of the following statements describes the reason for this sequence?

- a. To preclude potential HPCI isolation on high steam flow.
- b. To prevent warping the HPCI turbine blades.
- c. To ensure HPCI-14 valve operability prior to placing HPCI system in service.
- d. To ensure the ramp generator initiates the ramp function prior to opening the turbine stop valve.

Question: 21 (1.00)

Given the following conditions:

- LOCA with a loss of normal power has occurred
- Diesel Generator B fails to start
- Reactor Pressure is 250 psig
- Drywell Pressure is 4 psig

The CRO is able to energize the 4 KV Bus 3 from the Vernon Tie line.

Assume the CRO did not take any of the Bus 3 pumps to the pull-to-lock position prior to re-energizing the bus. Which of the following describes the expected response sequence upon re-energizing Bus 3?

- a. The A and B RHR pumps start 5 seconds after power is restored.
- b. The A and B RHR pumps start immediately after power is restored.
- c. The B Core Spray pump starts 10 seconds after power is restored.
- d. The B Core Spray pump starts immediately after power is restored.

Question: 22 (1.00)

During normal full power operation, the CRO is performing a core spray flow surveillance. The operator inadvertently takes the control switch for the CS-12 (pump discharge valve) to the open position. The CS-11 (pump discharge valve) is already open. What is the expected system response?

- a. CS-12 will not open with reactor pressure greater than 350 psig.
- b. CS-12 will not open due to a greater than 50 psig pressure differential across the valve.
- c. CS-12 will open and then automatically close to protect low pressure piping.
- d. CS-12 will open but will not inject with core spray pump discharge head less than reactor pressure.

Question: 23 (1.00)

Given the following conditions:

- the power supply for the SLC system at MCC-9B is open
- the unit experiences an ATWS
- SLC has been manually initiated by placing the pump control switch in SYS 1 and then in SYS 2 position (the switch remains in the SYS 2 position).

Which of the following describes the condition of the SLC system given the above conditions?

- a. Squib valve SLC 14A is open and the SLC Pump B is running.
- b. Squib valve SLC 14B is open and the SLC Pump A is running.
- c. Squib valve SLC 14A is open and the SLC Pump A is running.
- d. Squib valve SLC 14B is open and the SLC Pump B is running.

Question: 24 (1.00)

OP 2134 directs the Operators to reset a reactor scram by first placing the reset switch to the "Group 2 and 3" position then to the "Group 1 and 4" position. What would occur if the operators only action was to place the reset switch to the "Group 1 and 4" position?

- a. It would cause the vent and drain valves to open on the Scram Discharge Volume.
- b. It would direct draining of the reactor vessel to the Reactor Building Drain Sump.
- c. It would cause an inadvertent hydraulic lock in the Scram Discharge Volume piping.
- d. It would cause CRD charging water flow to be bypassed to the Reactor Building Drain Sump.

Question: 25 (1.00)

Given the following conditions:

- The plant had been operating at 100% power.
- A main turbine trip occurred.
- Reactor pressure on the transient reached 1155 psig and has returned to 980 psig.
- Reactor water level reached 105 inches and has returned to 150 inches.
- All plant systems responded as designed.

Given that the Scram Pilot Air Valves are de-energized, what is the status of the following components:

Backup Scram Valve (BSV) solenoids
Alternate Rod Insertion (ARI) valve solenoids

- a. BSV -- energized
ARI -- energized
- b. BSV -- energized
ARI -- de-energized
- c. BSV -- de-energized
ARI -- energized
- d. BSV -- de-energized
ARI -- de-energized

Question: 26 (1.00)

Given the following conditions with a plant startup in progress:

- the Mode Switch is in STARTUP
- IRMs are on Range 9
- APRM B is bypassed
- a half scram is inserted on the RPS "A" because of a recirculation flow comparator malfunction
- IRM B fails upscale causing annunciator IRM B, D, or F UPSCALE TRIP OR INOP to alarm.

Which of the following describes the response of the plant, if any, to these conditions?

- a. No plant response occurs.
- b. Only an insert rod block occurs.
- c. Only a withdraw rod block occurs.
- d. A full scram occurs.

Question: 27 (1.00)

Given the following conditions with a reactor startup in progress:

- The Mode Switch is in STARTUP.
- All IRMs are on Range 2 with stable indication.

The CRO verified proper SRM/IRM overlap and selects the SRM A and SRM B detectors to be withdrawn from the core. As the detectors are withdrawn, the detectors indicate the following:

SRM A 1.5E3 cps

SRM B 8.5E2 cps

Which of the following describes the plant response, if any, to these conditions?

- a. No response.
- b. A half scram is generated.
- c. A rod block is generated.
- d. The Retract Permissive Interlock is deenergized.

Question: 28 (1.00)

Given the following conditions:

- APRMs are indicating 74% power.
- Reactor Thermal Power is 1179 Mwt average.
- Core Flow is 36 Mlbs/hr.
- Two Recirculations loops are in operations with a Drive flow of 14600 gpm per loop.
- Thermal Limits are: MFLPD=.75; MAPRAT=.73; MFLCPR=.84.

Which of the following describes the highest APRM flow biased setpoint allowed by Technical Specifications?

- a. Less than or equal to 71.7%
- b. Less than or equal to 77.3%
- c. Less than or equal to 83.6%
- d. Less than or equal to 88.8%

Question: 29 (1.00)

Given the following conditions:

- A plant startup is in progress.
- The Recirculation flow input signal to Average Power Range Monitoring (APRM) is 25%.
- As recirculation flow is raised, the output signal from the "B" Flow Converter/Comparator Unit fails downscale.
- Actual recirculation loop flows respond as expected.

Which of the following describes the plant response to this condition?

- a. A full scram will occur due to flow biased neutron flux high.
- b. A control rod block will occur due to a flow converter/comparator out of limits trip.
- c. A half scram will occur due to the flow signal from B comparator being $> 7\%$ when compared to the A.
- d. A control rod block will occur due to flow converter/comparator unit "inop" signal.

Question: 30 (1.00)

Given the following conditions:

- Reactor is shutdown.
- RCIC is in service supporting cool down operations.
- RPV pressure is 220 psig.

Which of the following describes the effect on the RCIC System if ECCS level trip instruments (LT-2-3-72 A-D) reference legs flash to steam?

As a direct result of the d/p signal from the level instrument:

- a. RCIC 16 (Outbd Isolation) and RCIC 15 (Inbd Isolation) valves will close.
- b. RCIC 1 (trip throttle valve) will close.
- c. RCIC 131 (Steam supply valve) will close.
- d. No RCIC valves will close.

Question: 31 (1.00)

Given the following:

- The Unit has experienced a loss of all AC Power.
- RCIC automatically initiated and is injecting to the reactor vessel.
- A Steam Tunnel High Temperature Condition occurs.

Which of the following describes the expected RCIC response? (Assume no other Operator action.)

- a. No RCIC system isolation or turbine trip will occur, the system remains in service.
- b. A RCIC system isolation will occur; both the Inboard and Outboard Steam Isolation Valves (RCIC-15 and RCIC-16) close.
- c. A RCIC system isolation will occur except the Inboard Steam Isolation Valve (RCIC-15) will not close.
- d. A RCIC system isolation will occur except the Outboard Steam Isolation Valve (RCIC-16) will not close.

Question: 32 (1.00)

With a loss of DC-2C (125 vdc) and an ADS system initiation signal present, which of the following describes the response of the ADS System?

- a. Only ADS relief valves A and C will open since ADS logic A has a backup power supply.
- b. Only ADS relief valves B and D will open since ADS logic B has a backup power supply.
- c. All ADS relief valves will open since ADS logic A has a power supply.
- d. All ADS relief valves will open since ADS logic B has a power supply.

Question: 33 (1.00)

Which of the following describes the a minimum condition under which the Rx Bldg to Torus Vacuum Breakers will open?

- a. When Rx Bldg pressure exceeds the Torus pressure by 1.7 psid.
- b. When Rx Bldg pressure exceeds the Torus pressure by 0.5 psid.
- c. When the Torus pressure exceeds Rx Bldg pressure by 1.7 psid.
- d. When the Torus pressure exceeds Rx Bldg pressure by 0.5 psid.

Question: 34 (1.00)

The reactor is operating at 100% power. The following annunciators are received:

- MN STM LN RAD HI/DWNSCL (3-F-1)
- AUTO SCRAM CH A (5-K-1)
- MN STM LN RAD HI (5-K-6)

You confirm the RPS "A" half scram, but observed no PCIS valves went closed. The "C" main steam line rad monitor (PRM-17-251C) is not displaying any data and is determined to be in a tripped condition.

I&C technicians request to test the "D" main steam line rad monitor. This activity involves placing the mode switch for the rad monitor in INOP and UPSCALE TRIP. Which of the following describes the plant response if testing is allowed?

- a. A RPS "B" half scram with no PCIS Group I isolation.
- b. A RPS "B" half scram with a half Group I PCIS isolation will occur.
- c. A full scram will occur with no PCIS Group I isolation.
- d. A full scram with a full PCIS Group I isolation will occur.

Question: 35 (1.00)

A break has occurred inside containment on the nitrogen supply line to the SRVs.

Which of the following describes how manual operation of the SRVs is effected by this condition?

- a. SRV cycles are limited. More cycles are available at a high drywell pressure condition.
- b. SRV cycles are limited. Fewer cycles are available at a high drywell pressure condition.
- c. SRV cycles are unaffected because instrument air will realign automatically on lowering containment air receiver pressure.
- d. SRV cycles are unaffected because the nitrogen bottle will realign automatically on lowering containment air receiver pressure.

Question: 36 (1.00)

The amber light above SRV-71C is lit and annunciator 9-3-B-8, RX RELIEF VLV BELLOWS LEAKAGE, is alarming. A transient occurs which causes reactor pressure to rise to 1125 psig. Which of the following statements is true?

SRV-71C:

- a. will open
- b. will not open
- c. will open when operated from the alternate shutdown panel
- d. will not open in response to an ADS signal

Question: 37 (1.00)

The plant is operating normally at 100% power when the Speed Load Changer is taken to lower and held there.

What is the effect on reactor pressure?

- a. Reactor pressure will increase. The control valves close and the bypass valves remain as-is.
- b. Reactor pressure will decrease. The control valves remain as-is and the bypass valves open.
- c. Reactor pressure will remain constant. The control valves close and the bypass valves open.
- d. Reactor pressure will remain constant. The control valves and bypass valves remain as-is.

Question: 38 (1.00)

Given the following:

During a reactor startup, the CRO is directed to start the "B" Reactor Feed Pump with the following plant conditions present.

- Reactor vessel level is 165".
- Feed pump oil pressure is 15 psig.
- Feed pump oil temperature is 190°F.
- Two condensate pumps are running with a discharge pressure of 145 psig.

When the CRO takes the handswitch to start, the pump does not start. Based on the present plant conditions, which of the following conditions prevented the "B" reactor feed pump from starting?

- a. Condensate pump discharge pressure is too low.
- b. Feed pump oil pressure is too low.
- c. Reactor vessel level is too high.
- d. Feed pump oil temperature is too high.

Question: 39 (1.00)

Conditions:

- Rx power is 100%.
- Feedwater Level Control (FWLC) in three element control.
- Feedwater Flow Summer in the FWLC circuitry fails to a minimum (zero) output.

The resulting feed flow/steam flow mismatch causes actual feed flow to:

- a. Increase, and level stabilizes below the turbine trip setpoint.
- b. Decrease, recirc runs back and level stabilizes above SCRAM setpoint.
- c. Decrease, resulting in a low level reactor SCRAM.
- d. Increase, resulting in a turbine trip and reactor SCRAM.

Question: 40 (1.00)

Select the correct answer:

The SBGT system is in normal standby lineup. Which of the following describes the consequences of a total loss of air?

- a. All valves fail "AS-IS". SBGT will actuate under accident conditions.
- b. All valves fail "AS-IS". SBGT will not actuate under accident conditions.
- c. All valves fail in a position to provide a vent path. SBGT will actuate under accident conditions.
- d. All valves fail in a position to provide a vent path. SBGT will not actuate under accident conditions.

Question: 41 (1.00)

The CRO has just shutdown the B Diesel Generator (0 rpm) from the monthly surveillance test when a loss of normal power occurs. Which of the following statements describes the Diesel response to this condition? (AO has not taken any actions).

- a. The Diesel will start immediately.
- b. The Diesel will start after the stopping relay times out.
- c. The Diesel will start after the AO locally resets the fuel racks.
- d. The Diesel will start after the AO locally places the engine control to REMOTE.

Question: 42 (1.00)

Given the following:

The unit is operating at 100% power. The CRO receives an accumulator trouble alarm for a low pressure condition, for a control rod that is at position 48. An auxiliary operator is tasked to clear the alarm condition.

While the accumulator is isolated and being recharged a reactor scram occurs.

The control rod will:

- a. remain at its present position and not move.
- b. scram within Tech Spec allowable insertion time.
- c. scram at a slower than Tech Spec insertion time.
- d. drift into the full inserted position.

Question: 43 (1.00)

Given the following conditions:

- Control rod withdrawal activities for a reactor startup are in progress.
- While withdrawing control rod 26-27 one notch, the Reactor Manual Control System Master timer fails by generating a continuous withdrawal signal.

Which of the following describes the expected control rod response.

Control rod 26-27 will:

- a. Immediately receive a withdrawal block and stop moving.
- b. Immediately receive a Rod Select Block and will be deselected.
- c. Withdraw for a total of 2.0 seconds and then will receive a withdrawal block only.
- d. Withdraw for a total of 2.0 seconds and then will receive a Rod Select Block and will be deselected.

Question: 44 (1.00)

Given the following:

- Reactor power is 100%.
- The "A" recirculation pump No. 1 (inbd) seal pressure indicates 1000 psig.
- The "A" recirculation pump No. 2 (outbd) seal pressure indicates 850 psig.
- The PUMP A INNER SEAL LKG HI/LO alarm (4-C-2) annunciated.

Which of the following describes the operator's action for these parameters?

- a. Secure the affected recirculation pump MG set and close the suction valve first, then the pump discharge and bypass valves.
- b. Failure of one recirculation pump seal does not require operator action other than monitoring seal temperatures closely.
- c. Trip the affected recirculation pump and immediately close the pump discharge valve and set the speed of the running pump as directed by the SCRO..
- d. Direct the Auxiliary Operator to adjust the reactor building closed cooling water system temperature to 100°F and pressure to 75 psig.

Question: 45 (1.00)

During normal Reactor Water Cleanup (RWCU) system operations, a loss of system flow through the RWCU filter demineralizer vessel occurred. What safety concern exists regarding this condition?

- a. Potential resin intrusion into the reactor vessel.
- b. Loss of pre-coat pump flow to the filter demineralizer.
- c. Non-Regenerative Heat-Exchanger heat load limits.
- d. Reactor water will be discharged to the radwaste system.

Question: 46 (1.00)

Given the following:

- Reactor is shutdown.
- Shutdown cooling valves RHR-17 and RHR-18 are open.
- OP 2124 directs the CRO to maintain reactor level greater than 185 inches.

Which of the following describes the basis for maintaining this level?

- a. Make up for the 14" inventory loss when opening RHR-17 and RHR-18.
- b. Prevent thermal stratification in the RPV upon loss of shutdown cooling.
- c. Provide minimum NPSH for the in service RHR pump.
- d. Ensure natural circulation flow in the recirculation loops.

Question: 47 (1.00)

Given the following conditions with a plant startup in progress:

- Reactor power is 33%.
- APRM "B" has failed downscale and is bypassed.
- Control rod 22-23, a center rod, is selected for withdrawal.
- RBM selected LPRM strings indicate that a single level "A" LPRM and a single level "C" LPRM are bypassed.

Which of the following describes the current status of the RBM system?

- a. RBM "A" is operable and RBM "B" is operable.
- b. RBM "A" is operable and RBM "B" is inoperable.
- c. RBM "A" is inoperable and RBM "B" is operable.
- d. RBM "A" is inoperable and RBM "B" is inoperable.

Question: 48 (1.00)

The plant has been shutdown due to a leaking SRV. RHR Loop B is in torus cooling while RHR Loop A is in shutdown cooling. A small leak causes drywell pressure to go up to 2.5 psig. Which one of the following describes the response of the RHR system?

- a. Loop A pumps trip and Loop B pumps trip.
- b. Loop A pumps trip and Loop B pumps inject into the vessel (LPCI).
- c. Loop A injects into the vessel (LPCI) and Loop B pumps trip.
- d. Loop A injects into the vessel (LPCI) and Loop B injects in the vessel (LPCI).

Question: #49 (1.00)

You are directed to initiate Drywell Spray with RHR Loop "B" 20 minutes after a LOCA. The following conditions are present:

- Drywell and Suppression Chamber pressures are 10 psig.
- RPV level is -54 inches on LT-2-3-91A/B (Shroud Level) and slowly rising.
- Both RHR Pumps A and B are injecting through the heat exchangers.

WHICH ONE of the following is required before you can open MOV-26B?

- a. Place only RHR B/D LOGIC CTMT SPRAY VLV LPCI SIG BYPASS SWITCH (Pistol Grip) in the MANUAL position.
- b. Place only the RHR B/D LOGIC CTMT SPRAY VLV SHROUD LEVEL OVRD SWITCH (Keylock) in the MANUAL OVERRIDE position.
- c. Place the RHR B/D LOGIC CTMT SPRAY VLV LPCI SIG BYPASS SWITCH (Pistol Grip) in the MANUAL position and then place the RHR B/D LOGIC CTMT SPRAY VLV SHROUD LEVEL OVRD SWITCH (Keylock) in the MANUAL OVERRIDE position.
- d. Place the RHR B/D LOGIC CTMT SPRAY VLV SHROUD LEVEL OVRD SWITCH (Keylock) in the MANUAL OVERRIDE position and then place the RHR B/D LOGIC CTMT SPRAY VLV LPCI SIG BYPASS SWITCH (Pistol Grip) in the MANUAL position.

Question: 50 (1.00)

Given the following conditions:

- Reactor power is 60%.
- The A Main Steam Line is isolated (MS 80A and MS 86A are closed).
- The D Main Steam Inboard Isolation Valve, MS 80D drifts closed.

Which of the following describes the plant response to these conditions?

- a. A full reactor scram occurs.
- b. Reactor operations continue and all RPS logic channels remain energized.
- c. Reactor operations continue, but a half scram results on the "A" side of RPS.
- d. Reactor operations continue, but a half scram results on the "B" side of RPS.

Question: 51 (1.00)

Why is MS-6, Steam Seal Regulator Inlet valve opened at 70% rated thermal power?

- a. It prevents the seal regulator unloading valve from hunting.
- b. The high pressure turbine leakage will no longer seal the turbine shafts.
- c. The low pressure turbine leakage will no longer seal the turbine shafts.
- d. The steam packing exhauster has excessive capacity for this power level.

Question: 52 (1.00)

During a reactor shutdown, why is a condensate pump secured when reactor feedpump suction pressure reaches 450 psig?

- a. It prevents lifting the feedpump suction relief valves.
- b. It prevents damage to the condensate demineralizer gaskets.
- c. It prevents overloading the condensate pump thrust bearing.
- d. It prevents condensate pump current from exceeding 190 amps.

Question: 53 (1.00)

The plant was operating at full power, when a fault occurred on Bus 8.

Which of the following is the expected plant response?

- a. A full PCIS Group I isolation occurs.
- b. A full PCIS Group II isolation occurs.
- c. A full PCIS Group III isolation occurs.
- d. A full PCIS Group V isolation occurs.

Question: 54 (1.00)

Given the following conditions:

- 120V AC Vital Manual Transfer Switch on CRP 9-8 has been placed in Alternate.
- Vital AC MG set is secured.
- The red light above the transfer switch on CRP 9-8 is illuminated on "ALTERNATE".
- The remainder of the electrical system is in a normal configuration.

Which of the below describes the Vital and Instrument AC status when MCC 9A becomes de-energized?

- a. Instrument AC is energized from MCC 8A and Vital AC is de-energized.
- b. Instrument AC is de-energized and Vital is energized from MCC 8A.
- c. Both Instrument AC and Vital AC are energized from MCC 8A.
- d. Both Instrument AC and Vital AC are de-energized.

Question: 55 (1.00)

While shutting down using Alternate Shutdown methods, Transfer Switch MTS-13-1 is placed to the EMERGENCY position. This aligns DC-2B to be powered from:

- a. 125 VDC Emergency Bus (DC-1AS).
- b. 125 VDC Control Power Bus (DC-5A).
- c. 48 VDC Emergency Bus (DC-6A).
- d. 24 VDC ECCS Bus (Panel "A").

Question: 56 (1.00)

The plant is operating at 100% power. AOG system component status is as follows:

- "A" Recombiner in OPERATE
- "B" Recombiner in MANUAL (OG-101B & 103B valves SHUT)
- "A" Dryer Skid in AUTO
- "A" Vacuum Pump in AUTO (OG-140A & 144A valves SHUT)
- "B" Vacuum Pump in AUTO

A system transient has caused these conditions to exist:

- System Inlet Pressure - 2.5 psig
- Recombiner Outlet [H₂] - 100% LEL
- Recombiner Inlet Temperature - 355°F
- "A" Dryer Skid Inlet Pressure - 2 psig

The expected system response as a result of the above conditions is:

- a. "A" Recombiner shifts to OFF, "B" Recombiner shifts to AUTO, "A" Vacuum Pump starts.
- b. "A" Recombiner shifts to STANDBY, "B" Recombiner remains in MANUAL, "B" Vacuum Pump trips.
- c. "A" Recombiner shifts to OFF, "B" Recombiner remains in MANUAL, "A" Vacuum Pump starts.
- d. "A" Recombiner shifts to STANDBY, "B" Recombiner shifts to STANDBY, "B" Vacuum Pump trips.

Question: 57 (1.00)

What is the response of Rx Bldg ventilation rad monitor "A" when you swap RPS Bus "A" to its alternate power supply?

Rx Bldg Vent Rad Monitor "A" will:

- a. deenergize and remain deenergized; NO PCIS Group III isolation will occur.
- b. deenergize and reenergize; NO PCIS Group III isolation will occur.
- c. deenergize and remain deenergized; a full PCIS Group III isolation will occur.
- d. deenergize and reenergize; a full PCIS Group III isolation will occur.

Question: 58 (1.00)

Given the following conditions:

- A loss of power to Buses 2, 4 and 9 has occurred.
- "A" Diesel Generator started and loaded.
- "B" Service Water Pump is out of service.
- "Diesel Fire Pump Trouble" alarm (K-9 on CRP 9-6) is alarming.
- "Electric Fire Pump Trouble" alarm (M-9 on CRP 9-6) is alarming.

For the given conditions:

- a. Both alarms are expected.
- b. The Diesel Fire Pump Trouble alarm is not expected.
- c. Neither alarm is expected.
- d. The Electric Fire Pump Trouble alarm is not expected.

Question: 59 (1.00)

Which of the following is the only automatic action that occurs on lowering instrument air pressure?

- a. The service air header isolates.
- b. The instrument air dryer is bypassed.
- c. The service and instrument air systems are cross-connected.
- d. The off-service scram air header pressure control valve opens.

Question: 60 (1.00)

The plant is operating at 50% power when a complete loss of service water to the TBCCW HXs occurs.

Which of the following statements describes the effect on the reactor feedwater system?

- a. Feed pump bearing temperature rises.
- b. Feed pump motor winding temperature rises.
- c. Feed pump bearing and motor winding temperature rises.
- d. Feed pump bearing and motor winding temperature will not be affected.

Question: 61 (1.00)

A reactor scram due to a low level condition has occurred. The ball and shear valves are open. (Assume no operator actions).

This condition is:

- a. A normal condition since the shear valves are normally open.
- b. A normal condition since the ball valves are normally open.
- c. An abnormal condition since the shear valves should be closed.
- d. An abnormal condition since the ball valves should be closed.

Question: 62 (1.00)

The plant is operating at 100% power with Fuel Pool Cooling Pump (FPC) "A" in service. A leak develops upstream of the inlet isolation valves (FPC 220 and FPC 221). Which of the following describes the expected system response as fuel pool level starts to lower?

- a. FPC-220/221 remain open and "A" FPC Pump continues to run.
- b. FPC-220/221 remain open and "A" FPC Pump trips.
- c. FPC-220/221 close and "A" FPC Pump continues to run.
- d. FPC-220/221 close and "A" FPC Pump trips.

Question: 63 (1.00)

The refueling platform is over the fuel pool.

Which of the following, by itself, will prevent the refueling platform moving over the vessel.

- a. Mode switch in startup.
- b. Mode switch in refuel.
- c. One control rod not full in.
- d. Any refueling hoist loaded.

Question: 64 (1.00)

Which of the following describes how the Reactor Building Ventilation Backdraft Dampers are configured? Air flow is from:

- a. The lowest temperature areas to the highest temperature areas.
- b. The inner-most (center) areas to the outer-most areas.
- c. The less contaminated areas to the more contaminated areas.
- d. The ECCS pump rooms to the refueling floor area.

Question: 65 (1.00)

Given the following conditions:

- Reactor power is 100%.
- Main Generator Load Reject occurs causing a reactor scram.

Which of the following describes the plant parameter response to the Load Rejection immediately prior to the scram?

- a. Reactor pressure decreases - reactor water level decreases - reactor power decreases.
- b. Reactor pressure decreases - reactor water level increases - reactor power increases.
- c. Reactor pressure increases - reactor water level decreases - reactor power increases.
- d. Reactor pressure increases - reactor water level increases - reactor power decreases.

Question: 66 (1.00)

A manual reactor scram is inserted at 100% power. Immediately following the scram, reactor water level will initially:

- a. lower due to collapse of voids in the reactor vessel.
- b. rise due to the effect of three element reactor level control.
- c. lower due to excessive void formation in the downcomer region.
- d. rise due to the in rush of water from the downcomer region to the core region.

Question: 67 (1.00)

Given the following conditions:

- Reactor power - 100%.
- RX PRESS HI (5-E-7) annunciated.
- Reactor pressure indicates 1032 psig and trending upward.
- The manual pressure regulator (MPR) was in control at the time of the event.
- The electric pressure regulator (EPR) is available (i.e., it is not in the "CUTOUT" position).

Which of the following statements describes the immediate operator action?

- a. Control reactor pressure with bypass valve bypass jack.
- b. Take manual control of and lower recirculation flow, as necessary.
- c. Take manual control of and lower the EPR setpoint, as necessary.
- d. Insert a manual reactor scram.

Question: #68 (1.00)

The plant is operating at 100% power with the "B" Reactor Recirculation Pump scoop tube locked when a reactor scram occurs.

Which ONE of the following actions are REQUIRED?

- a. Direct a licensed operator to manually position the "B" Reactor Recirculation MG set scoop tube to minimum speed.
- b. Direct any member of the operating crew to manually position the "B" Reactor Recirculation MG set scoop tube to minimum speed.
- c. Unlock the scoop tube, if possible, then run the "B" Reactor Recirculation pump to minimum speed.
- d. Trip the "B" Reactor Recirculation Generator Set.

Question: 69 (1.00)

The plant has experienced a LOCA with fuel failure. You are currently in the SAGs and have direction to vent the drywell. Which one of the following vent paths will both vent the drywell and minimize radioactive releases? (Assume each vent path passes identical CFM.)

- a. Open AC-7B Torus vent and vent through the SGT.
- b. Open AC-7A Drywell vent and vent through the SGT.
- c. Open AC-7B Torus vent and vent through Rx Bldg Exhaust.
- d. Open AC-7A Drywell vent and vent through Rx Bldg Exhaust.

Question: 70 (1.00)

Given the following conditions:

- A reactor startup was in progress following a seven day forced outage.
- Reactor was made critical and a heatup was in progress.
- Problems with the reactor manual control circuitry delayed rod withdrawals for about 1.5 hours.
- RPV pressure decreased from 360 psig to 325 psig during this delay.
- Control rod 14-19 was withdrawn one notch from 10 to 12 to re-establish a heatup rate.
- Reactor period continued to shorten and the operator re-inserted the rod to notch 10 to determine why the SRM count rate is higher now than when previously on notch 10.

The change in SRM count rate indication is normal because:

- a. Xenon burnout in the high flux region had begun.
- b. Void fraction had decreased due to the lower pressure.
- c. Rod worth increased due to the increased rod density.
- d. Moderator temperature had decreased.

Question: 71 (1.00)

Given the following event:

- The main turbine is tripped.
- Reactor power is 60%.
- MSIVs are closed.

As per EOP-2, ATWS, which of the following describes a required action and the reason for it?

- a. Stabilize RPV pressure by manually opening safety relief valves to minimize power fluctuations.
- b. Reduce RPV pressure with turbine bypass valves to minimize torus heatup through HPCI operation.
- c. Stabilize RPV level with RCIC to prevent automatic initiation of LPCI pumps.
- d. Reduce RPV level with reactor water cleanup to letdown water to the main condenser.

Question: 72 (1.00)

A plant transient has required the crew to scram the unit from 75% power. The following plant conditions exist:

- Reactor level is +120".
- All 89 scram lights on the full core display are ON.
- Several control rods indicate that they have not inserted to or beyond notch 02.

Based on these indications, it can be determined that:

- a. There has been an electrical malfunction with one of the scram relays.
- b. There is a blockage in the scram discharge volume.
- c. There has been a mechanical failure of the scram valves.
- d. The DC powered scram air header vent valves failed to operate.

Question: 73 (1.00)

The plant is operating at power when a spurious Group I isolation occurs.

- All control rods remain at their original positions.
- APRMs indicate approximately 96% power.
- All 4 SRVs have opened automatically and RPV pressure is > 1200 psig.
- Core flow is 45 mlb/hr.

The CRO attempts a manual scram which fails to insert control rods and scram air header pressure remains at 75 psig.

Without direction, the CRO must immediately:

- a. Inject boron.
- b. Drive control rods.
- c. Initiate ARI/RPT.
- d. Lower RPV water level.

Question: 74 (1.00)

A NOTE in OP 2115, Primary Containment, states that only one 18-inch supply valve, AC-8 or AC-10, and one 18-inch vent valve, AC-7A or AC-7B, may be opened at a time.

Which of the following statements describes the basis for this requirement?

- a. Prevent bypassing the torus during a DBA LOCA.
- b. Prevent bypassing the drywell during a DBA LOCA.
- c. Prevent actuating the torus/drywell vacuum breakers.
- d. Prevent reducing containment differential pressure to less than 1.5 psig.

Question: 75 (1.00)

Which of the following resulting combinations of reactor power and pressure indicate a violation of a Safety Limit?

- a. Reactor Power -- 22%
Reactor Pressure -- 765 psig
- b. Reactor Power -- 27%
Reactor Pressure -- 775 psig
- c. Reactor Power -- 30%
Reactor Pressure -- 800 psig
- d. Reactor Power -- 35%
Reactor Pressure -- 815 psig

Question: 76 (1.00)

Which set of conditions assures adequate core cooling?

- a. CS "A": 0 gpm
CS "B": 1650 gpm
RPV level: +6" steady
- b. CS "A": 2000 gpm
CS "B": 1500 gpm
RPV level: -40" steady
- c. CS "A": 3100 gpm
CS "B": 0 gpm
RPV level: -10" steady
- d. CS "A": 3500 gpm
CS "B": 3500 gpm
RPV level: -65" steady

Question: 77 (1.00)

Given the following conditions:

- ATWS has occurred, the reactor is not shutdown.
- Reactor power was at 100%.
- A complete loss of circulating water has occurred requiring a scram.
- Recirculation flow has been reduced to minimum.
- The mode switch is in SHUTDOWN.
- Torus temperature is 112°F.

For these conditions, what parameter is the operator required to use to determine if injection of the Standby Liquid Control is immediately required by assessing which of the following?

- a. The Full Core Display.
- b. APRM power levels.
- c. Torus Temperature.
- d. The RPS group logic white lights.

Question: 78 (1.00)

A plant startup is in progress with the plant at 10% power when the "A" recirc pump trips. The A recirc discharge valve (RV-53A) is shut by the CRO. Total jet pump flow as indicated on DPR/FR-2-3-91 is to the left of the natural circulation line on the power to flow map.

Which of the following describes reason for this indication?

- a. A jet pump mixer has been displaced.
- b. The jet pump flow instruments are inaccurate at low flows.
- c. The reverse flow summer is subtracting positive flow through the idle loop jet pumps.
- d. The recirculation flow comparator is compensating for the natural circulation in the idle loop.

Question: 79 (1.00)

The following conditions exist:

- Main condenser backpressure: 5.4" Hg and rising rapidly.
- Circ water in OPEN cycle.
- CRO is reducing Reactor Power with recirc flow at 9%/min.
- Annunciator 9-5-K-8, "STOP/CTRL VLV FAST CLOSURE BYP" is clear.
- TB AO reports visible damage to the LP turbine exhaust boot and the sound of air rushing through.

The SCRO directs the crew to transfer station loads, scram the reactor, then trip the turbine. These actions are required because:

- a. Turbine blade damage may result from excessive exhaust pressure.
- b. A group 1 isolation can be avoided, preserving the main condenser as a heat sink.
- c. The resulting backpressure induced vibration could cause turbine shaft seal failure.
- d. An automatic turbine trip due to low vacuum will NOT cause a scram in this condition.

Question: 80 (1.00)

A loss of offsite power has occurred and EDG "A" and "B" have failed to start. Busses 1, 2, 3, 4 and 5 are de-energized. All service water pumps have been placed in STOP, then NORMAL. All ECCS pumps are in PULL-TO-LOCK.

The next immediate operator action is to:

- a. Minimize DC loads on station batteries.
- b. Place all reactor feed pumps in PULL-TO-LOCK.
- c. Direct an AO to attempt a local start of EDG "B".
- d. Attempt to energize Bus 3 or 4 from the Vernon Tie.

Question: 81 (1.00)

Given the following conditions:

- Reactor operating at 100% power.
- A complete loss of DC-1 occurs.
- The "A" Recirc Drive Motor amps are pegged high.
- Reactor water level is steady.

What action is required concerning the Reactor Recirc system?

- a. Trip the "A" Recirc MG Drive Breaker locally.
- b. Insert a Manual Reactor Scram.
- c. Trip the "A" Recirc MG DC Lube Oil Pump.
- d. Trip the "A" Reactor Feedwater Pump immediately.

Question: 82 (1.00)

The reactor is operating at 100% power, when the controlling reactor level instrument fails downscale. Which of the following statements describes the correct plant response and operator action?

- a. Reactor water level will lower. The operator shall immediately transfer to Single-Element feedwater control.
- b. Reactor water level will lower. The operator shall immediately transfer the reactor vessel feedwater Master Controller to Manual.
- c. Reactor water level will rise. The operator shall immediately transfer to Single-Element feedwater control.
- d. Reactor water level will rise. The operator shall immediately transfer the reactor vessel feedwater Master Controller to Manual.

Question: 83 (1.00)

A loss of drywell cooling results in a drywell pressure reaching 2.6 psig.

WHICH of the following describes EDG, RCIC, and RWCU response?

- a. EDGs - running and loaded
RCIC - running and injecting
RWCU - pumps tripped
- b. EDGs - running and NOT loaded
RCIC - not affected
RWCU - not affected
- c. EDGs - running and loaded
RCIC - not affected
RWCU - pumps tripped
- d. EDGs - running and NOT loaded
RCIC - running and injecting
RWCU - not affected

Question: 84 (1.00)

Given the following conditions:

- Torus water level is 8 feet.
- Torus water temperature is 180°F.
- Reactor pressure is 700 psig.

Under these conditions, RPV Emergency Depressurization is:

- a. Not required since primary containment limits are not exceeded.
- b. Required to ensure the energy released during an RPV blowdown can be accepted.
- c. Required since the downcomers are now exhausting to the torus free air space.
- d. Prohibited since the SRV tail pipes are now exhausting to the torus free air space.

Question: 85 (1.00)

Given the following conditions:

- A transient occurred requiring Control Room evacuation.
- All required immediate actions per OP3126, Shutdown Using Alternate Shutdown Methods were completed.
- RCIC is being operated for reactor level control from the RCIC Alternate Shutdown Panel (ASP).
- The RCIC turbine coasted to a stop with NO apparent reason indicated at the ASP.

Which of the following describes what occurred to the RCIC system and the system's current status?

- a. A RCIC high level turbine trip setpoint has been exceeded that cannot be reset preventing RCIC from being restarted from the ASP.
- b. A RCIC turbine trip setpoint has been exceeded that can be locally reset allowing RCIC to be restarted from the ASP.
- c. A RCIC system isolation has been exceeded and RCIC is no longer available for reactor water level control from the ASP.
- d. A RCIC system isolation setpoint has been exceeded with RCIC restart possible once the isolation signal is reset from the ASP.

Question: 86 (1.00)

Due to loss of RBCCW, alternate cooling to the RHR pump coolers is being established.

Which of the following describes the operational concern when the operator opens valves SW-36 A(B), SW Loop A(B) X-ties to Alternate Cooling?

- a. RHR SW pump runout may occur.
- b. The RBCCW piping may be overpressurized.
- c. Cross-system contamination from the RBCCW to the RHR SW system will occur.
- d. The RBCCW surge tank will fill and overflow.

Question: 87 (1.00)

ON 3146, Low Instrument/Scram Air Header Pressure, requires a manual scram if scram air header pressure drops below 55 psig and cannot be restored.

With the plant at full power, which of the following describes the basis for the scram?

- a. Below 55 psig, accumulator pressure is no longer sufficient to ensure that the control rod would meet its required insertion time.
- b. The scram eliminates the undesirable effects of the irregular rod patterns from random rod insertion.
- c. SDV in-leakage from the drifting open of the scram inlet and outlet valves would create a hydraulic lock, preventing a scram.
- d. The SDV drain valves will fail open and cause the reactor building to become contaminated in the event of a scram.

Question: 88 (1.00)

The plant is operating at 70% reactor power when the "A" outboard MSIV fails closed.

Which of the following describes the response of the reactor? (Assume no operator action is taken).

- a. Reactor power will decrease and stabilize at a lower power.
RPV water level will decrease and then return to a normal level.
- b. Reactor power will decrease and stabilize at a lower power.
RPV water level will increase and then return to a normal level.
- c. Reactor power will increase and stabilize at a higher power.
RPV water level will decrease and then return to a normal level.
- d. Reactor power will increase and stabilize at a higher power.
RPV water level will increase and then return to a normal level.

Question: 89 (1.00)

Given the following plant conditions:

- A reactor startup is in progress.
- Reactor pressure is at 800 psig.
- Both CRD pumps fail.
- Two CRD accumulators are in an alarm condition for low nitrogen pressure.

Which of the following statements describes the significance of 800 psig reactor pressure in this condition?

- a. Below 800 psig, the core pressure drop is such that design peaking factors are conservative enough to ensure thermal power limits will not be exceeded with slower rod insertions times.
- b. Below 800 psig, those rods with inoperable accumulators will be able to meet required scram insertion times due to the action of reactor pressure.
- c. Above 800 psig, the core pressure drop is such that design peaking factors are conservative enough to ensure thermal power limits will not be exceeded with slower rod insertions times.
- d. Above 800 psig, those rods with inoperable accumulators will be able to meet required scram insertion times due to the action of reactor pressure.

Question: 90 (1.00)

While performing the Torus Temperature Control leg of EOP-3, Primary Containment Control, the operator is directed to enter EOP-1, RPV Control, and execute concurrently before torus temperature reaches 110°F.

Which of the following describes the reason for entering and performing EOP-1 concurrently without a specific EOP-1 entry condition being met?

- a. It ensures that torus temperature will never exceed the Heat Capacity Temperature Limit.
- b. It ensures that a RHR pump is dedicated to torus cooling regardless of actual reactor water level.
- c. It directs a reactor scram and removes the main source of potential energy addition to the torus before conditions warrant injection of boron.
- d. It provides direction for reactor pressure control should torus temperature reach the point requiring emergency depressurization with the Turbine Bypass Valves.

Question: 91 (1.00)

Which of the following describes the reason the reactor is to be emergency depressurized when drywell temperature cannot be restored and maintained below 280°F?

At 280°F:

- a. The drywell spray nozzels are ineffective.
- b. The reactor vessel water level cannot be determined.
- c. The containment's design temperature is being challenged.
- d. The heated drywell spray water returning to the torus is reducing the RHR pumps NPSH.

Question: 92 (1.00)

A LOCA has occurred and EOP-3, "Primary Containment Control", has been entered. The SCRO is about to order the CRO to spray the drywell but first asks the CRO to verify torus level is below 23 ft. The concern for this is that if spray is initiated when torus level is above 23 ft.:

- a. Torus level will cause RHR to cavitate.
- b. Torus spray header will be submerged.
- c. Torus capacity is insufficient to accept spray water.
- d. Torus-Drywell vacuum breakers will be submerged.

Question: 93 (1.00)

Which of the following describes the reason HPCI must be secured at a torus water level of less than seven feet irrespective of adequate core cooling?

- a. Continued operation will add pressure to the torus.
- b. The HPCI oil system will not receive adequate cooling water.
- c. Below this level the RHR system cannot adequately dissipate the heat the HPCI turbine will add to the pool.
- d. Below this level the torus will not provide sufficient NPSH to the suction of the HPCI pump.

Question: 94 (1.00)

While controlling secondary containment parameters using EOP-4, the operator may be directed to secure certain systems discharging into the secondary containment. The operator would secure which of the following?

- a. CRD pump A with a leaking discharge flange. Reactor water level is steady at 75 inches. No other sources of high pressure water are available to feed the reactor.
- b. RHR pump B with 400 GPM leaking out of the pump discharge valve. RHR pump B is in drywell spray. RHR pump A is available, but the plant is no longer in the safe area of the Drywell Spray Initiation Limit Curve.
- c. SLC pump A with 15 GPM leaking from the squib valve. An ATWS is in progress and SLC pump B is disassembled.
- d. A fire header leaking 100 GPM into an RHR pump room. The fire header is the only source of water to fight the fire into the HPCI pump room.

Question: 95 (1.00)

With a Reactor Building Vent Exhaust greater than 14 mRem/hr present, EOP-4, Secondary Containment Control, directs the operator to confirm or initiate Reactor Building HVAC Isolation and a Standby Gas Treatment System startup.

This action will ensure that:

- a. A processed and controlled ground release of activity is provided.
- b. A processed and controlled elevated release of the activity is provided.
- c. The Reactor Building atmosphere is contained at a positive pressure until it can be processed and released.
- d. Both the primary and secondary containments are maintained at a slightly negative pressure.

Question: 96 (1.00)

The Advanced Offgas System radiation monitor, RAN-OG-3127 trips on a valid Hi-Hi trip signal. The dryer skid and absorber bypass valves (OG-145, OG-146) are open.

Which of the following describes the stack isolation valve, OG-FCV-11, response to the radiation monitor trip?

- a. The valve will remain open.
- b. The valve will close concurrent with the trip signal.
- c. The valve will close after the trip signal has been present for 2 minutes.
- d. The valve will close after the trip signal has been present for 30 minutes.

Question: 97 (1.00)

Given the following conditions:

- The reactor is in COLD SHUTDOWN
- A loss of shutdown cooling occurred

Based on the direction in ON-3156, Loss of Shutdown Cooling, the SCRO directs a feed and bleed. RWCU letdown is established as the bleed method.

What system shall be directed as the feed method in accordance with ON 3156?

- a. Injection by using CRD pumps.
- b. Injection by using the CS pumps.
- c. Condensate Transfer through the LPCI system.
- d. Condensate and Feed using the condensate pumps.

Question: 98 (1.00)

The unit is in a refueling outage with core alterations in progress. As the CRO, you note the following indications:

- "Rx Bldg/Refuel Flr CH B Rad Hi" annunciator 9-5-J-1 is lit.
- The reactor building ventilation system isolates.
- The standby gas treatment system initiated.

You shall immediately perform which one of the following:

- a. Determine if the alarm is a distraction (nuisance alarm) due to a transitory event.
- b. Announce via the Gaitronics to evacuate the refuel floor.
- c. Notify Chemistry and Rad. Protection to commence sampling and surveying to determined the source of the activity.
- d. Monitor the radiation instrument to determine if the alarm is due to downscale or high radiation.

Question: 99 (1.00)

A leak into the Secondary Containment has resulted in entry into EOP-4, Secondary Containment Control. Two area temperatures have exceeded their Maximum Safe Operating Limit. As a result, the SCRO has directed an RPV-ED.

What is the basis for performing an RPV-ED?

- a. Precludes further area temperature increases, which will prevent operator access required for safe shutdown of the plant.
- b. Precludes further area temperature increases, which will pose a threat to environmental qualifications of equipment required for safe shutdown.
- c. Rejects heat to the main condenser in preference to the secondary containment.
- d. Rejects heat to the main condenser in preference to the primary containment.

Question: 100 (1.00)

A fire protection header rupture has resulted in 5 inches of water in the RCIC room.

Entry into EOP-4 is:

- a. Required immediately.
- b. Required when water level reaches 12 inches.
- c. Not required because only one area was affected.
- d. Not required because the Fire Protection System is not a primary system.

VERMONT YANKEE - RO EXAM - ANSWER KEY - 09/00

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

B 10/3/00

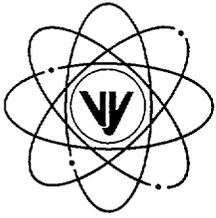
B 10/3/00

VERMONT YANKEE - RO EXAM - ANSWER KEY - 09/00

QUES	ANS					QUES	ANS				
51.	B					76.	A				
52.	B					77.	C				
53.	C					78.	C				
54.	A					79.	A				
55.	A					80.	D				
56.	C					81.	B				
57.	D					82.	D				
58.	B					83.	B				
59.	A					84.	B				
60.	A					85.	B				
61.	D					86.	B				
62.	D					87.	B				
63.	A					88.	D				
64.	C					89.	D				
65.	C					90.	C				
66.	A					91.	C				
67.	C					92.	D				
68.	D					93.	A				
69.	A					94.	B				
70.	D					95.	B				
71.	A					96.	C				
72.	B					97.	A				
73.	C					98.	B				
74.	A					99.	B				
75.	B					100.	A				

Attachment 3

LICENSEE POST-EXAMINATION COMMENTS



**VERMONT YANKEE
NUCLEAR POWER CORPORATION**

185 Old Ferry Road, Brattleboro, VT 05301-7002
(802) 257-5271

RECEIVED
REGION 1

2000 SEP 29 AM 10: 48

September 28, 2000
TDL 00-012

Mr. Paul Bissett, Lead Examiner
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

Subject: Facility comments on NRC developed written examination administered on 9/15/00

Dear Sir:

Facility comments on the written examination administered on 9/15/00 are presented for your review. Attached you will find for your consideration:

1. Tabulation of student answers compared to the preliminary Examination Key.
2. Individual question comments.
3. Proctor notes from examination administration.

If you should have any questions, please contact Michael E. Gosekamp, Operations Training Manager, at 802-258-4161.

Sincerely,

Michael E. Gosekamp

Question 29:

Missed: 3/4 RO

Answer D: 1D 3B

Given the following conditions:

- A plant startup is in progress
- The Recirculation flow input signal to Average Power Range Monitoring (APRM) is 25%
- As recirculation flow is raised, the output signal from the "B" Flow Converter/Comparator Unit fails downscale
- Actual recirculation loop flows respond as expected.

Which of the following describes the plant response to this condition?

- a. A full scram will occur due to flow biased neutron flux high.
- b. A control rod block will occur due to a flow converter/comparator out of limits trip.
- c. A half scram will occur due to the flow signal from B comparator being > 7% when compared to the A.
- d. A control rod block will occur due to flow converter/comparator unit "inop" signal.

Comment:

Answer D is not correct. Answer B is correct.

Reference: LOT-05-215, Rev 14 5/98, page 12, and Appendix B, page 2 of 2

The question states the flow Converter/comparator unit fails downscale, not that it loses power. It must lose power for a downscale trip to occur.

OUTLINE	NOTES
<p>5. Provides a 0 - 10 volt signal which corresponds to 0 - 125% flow</p> <p>6. Trips (Rod Block and Alarm)</p> <ul style="list-style-type: none">a. Flow Upscaleb. Inoperative - loss of power→ c. Comparator out of limits > 7% (flow signal from B is compared to A) <p>7. Flow Converter/Comparator Units are located in bottom of APRM cabinets. Only calibrated during Refueling Outages</p> <p>E. Trip Units:</p> <ul style="list-style-type: none">1. Hi and Hi-Hi<ul style="list-style-type: none">a. Two inputs<ul style="list-style-type: none">1) Trip level signal from slope and bias circuit (fixed reference signal)2) Core average power signal from the averaging circuitb. The two inputs are compared; if average power is above reference trip level then a scram and/or a rod block signal is provided	<p>8 volts = 100% flow</p> <p>White, Red lights (top) 3 Red lights (inside)</p> <p>Red light</p> <p>1 red light - High 1 red light - Low If comparator is > 7%, should have 1 Hi light on one unit and 1 Lo light on the other</p> <p>TRANSPARENCY 5 CRO Obj. 1e</p> <p>CRO Obj. 6 FND Obj. 3</p>

Rod Block	Setpoint	Bypassed
<p>7. SDV</p> <ul style="list-style-type: none"> a. Hi level b. SDV Hi level scram bypass switch <p>8. Refuel Interlocks</p> <ul style="list-style-type: none"> a. M.S. in STARTUP <ul style="list-style-type: none"> 1) Service platform loaded 2) Refuel platform over or near the core b. M.S. in REFUEL <ul style="list-style-type: none"> 1) Service platform loaded 2) Refuel platform over or near the core and <ul style="list-style-type: none"> a) Grapple not in full up b) Grapple loaded c) Frame hoist loaded d) Trolley hoist loaded 3) Selection of second rod <p>9. M.S. in SHUTDOWN</p> <p>10. With the M.S. in Refuel, one rod may be withdrawn</p> <p>11. Deselect blocks</p> <ul style="list-style-type: none"> a. RPIS Inop b. Rod select power off c. Timer malfunction 	<p>12 gal In Bypass and M.S. in SHUTDOWN or REFUEL</p> <p>400 lbs</p> <p>485 lbs 400 lbs 400 lbs</p> <p>None</p>	<p>None In Normal or Bypass and M.S. in STARTUP or RUN</p> <p>None</p> <p>None</p> <p>None None Notch override</p>

NOTE 1: SRM/IRM Inop

- 1. Low power supply voltage
- 2. Module unplugged
- 3. Mode switch not in Operate

NOTE 4: FLOW CONVERTER Inop

- 1. Circuit open/Loss of power

NOTE 2: APRM Inop

- 1. Module unplugged
- 2. Mode switch not in operate
- 3. Too few inputs
 - a. ≤ 12 B+E
 - b. ≤ 8 A,C,D,F

NOTE 3: RBM Inop

- 1. Module unplugged
- 2. Nulling sequence
- 3. Failure to null
- 4. Too few LPRM inputs
- 5. More than one rod selected
- 6. No rod selected
- 7. Mode switch not in operate

Question 36:

Missed: 2/4 RO

Answer B: 2B 1A 1C

The amber light above SRV-71C is lit and annunciator 9-3-B-8, RX RELIEF VLV BELLOWS LEAKAGE, is alarming. A transient occurs which causes reactor pressure to rise to 1125 psig. Which of the following statements is true?

SRV-71C:

- a. Will open
- b. Will not open
- c. Will open when operated from the alternate shutdown panel
- d. Will not open in response to an ADS signal

Comment:

The magnitude of this failure will determine valve response. The alarm occurs at 10 psig. As long as the outer bellows chamber is not full of water (incompressible) the valve may open at a higher pressure than its original set pressure. A could also be correct.

Question 68:

Missed: 2/4 RO

Answer D: 2D 1A 1C

The plant is operating at 100% power with the "B" Reactor Recirculation Pump scoop tube locked when a reactor scram occurs.

Which ONE of the following actions are REQUIRED?

- a. Direct a licensed operator to manually position the "B" Reactor Recirculation MG set scoop tube to minimum speed.
- b. Direct any member of the operating crew to manually position the "B" Reactor Recirculation MG set scoop tube to minimum speed.
- c. Unlock the scoop tube, if possible, then run the "B" Reactor Recirculation pump to minimum speed.
- d. Trip the "B" Reactor Recirculation Generator Set.

Comment:

ARS 4-B-1

The question is accurate as written.

Attachment 4

RESOLUTION OF POST-EXAMINATION COMMENTS

RO Test Question #29

Licensee Comment: Typographical error on the answer key. Answer "B" is the correct answer, vice answer "D."

NRC Response: Agree with the licensee. For question 29, change the correct answer from "D" to "B."

RO Test Question #36

Licensee Comment: Two correct answers because the magnitude of the failure of the bellows will determine the valve response. As long as the outer bellows is not full of water (incompressible), the valve may open at a higher pressure than its original set pressure. Therefore, answer "A" could also be correct in addition to answer "B."

NRC Response: Agree with licensee comment. Answers "A" and "B" will be accepted as being correct answers.