U.S. NUCLEAR REGULATORY COMMISSION
REGION I

REPLACEMENT EXAMINATIONS, REQUALIFICATION PROGRAM EVALUATION, AND BWR POWER OSCILLATION INSPECTION

Combined Report No. 50-271/89-18(OL)

Facility Docket No. 50-271

Facility License No. DPR-28

Licensee: Vermont Nuclear Power Corporation
RD5, Box 169
Ferry Road
Brattleboro, Vermont 05301

Facility Name: Vermont Yankee Nuclear Power Station

Replacement Examination Dates: October 23-27, 1989

NRC Examiners: N. Conicella, Operations Engineer
H. Williams, Senior Operations Engineer (Observer)
M. Daniels, Examiner, Sonalysts, Inc.
R. Miller, Examiner, Sonalysts, Inc.

Chief Examiner: N. Conicella, Operations Engineer — 1/4/90 date

Requalification Evaluation Dates: November 6-9, 1989

NRC Examiners: T. Fish, Senior Operations Engineer
N. Conicella, Operations Engineer
M. Daniels Examiner, Sonalysts, Inc.
R. Miller, Examiner, Sonalysts, Inc.

Chief Examiner: Todd Fish — T. Fish, Senior Operations Engineer — 1/4/90 date

Inspection Dates: October 23-27, 1989
November 6-9, 1989

Inspector: N. Conicella 1/4/90
N. Conicella, Operations Engineer — date
Division of Reactor Safety

Approved by: Richard J. Conte 1/4/90
Richard J. Conte, Chief, BWR Section — date
Operations Branch
Division of Reactor Safety

EXECUTIVE SUMMARY

1. REPLACEMENT EXAMINATION

A replacement examination was administered to three individuals who were applying for senior reactor operator (upgrade) licenses. The examinations consisted of a written examination, a dynamic simulator scenario, and a plant walk through. All three applicants passed all portions of these examinations. The examiners identified strengths and deficiencies as feedback to the licensee's training program.

2. REQUALIFICATION EXAMINATION/PROGRAM EVALUATION

Written and operating examinations were administered to three crews consisting of six reactor operators (ROs) and six senior reactor operators (SROs). The examinations were graded concurrently by the NRC and the facility training department. As graded by both the NRC and facility, all three crews performed satisfactorily and all ROs and SROs passed all portions of the examinations. The licensee's licensed operator training program was determined to be satisfactory based on the criteria established in Section ES-601 of NUREG-1021, Rev. 5. The examiners identified strengths and deficiencies as feedback to the licensee's training program

3. BWR POWER OSCILLATION INSPECTION

The inspection of the license's BWR Power Oscillation Program is documented in Section 4 of this report. No violations or deviations were identified. However, the licensee adequately implemented the requested actions of NRC Bulletin 88-07 and Supplement 1 with a weakness identified. Although the procedure revisions and the development of training lesson plans on the topic of BWR power oscillations were adequate, the licensee's process for ensuring that all licensed operators fully understood the major procedure revisions and the contents of new procedures developed was not completely effective. However, the licensee was receptive to the concerns of the inspector and was able to correct all problems or deficiencies noted by the inspector in a timely fashion.

DETAILS

1. INTRODUCTION

1.1 Replacement Examination

During the examination period the NRC conducted replacement examinations for three individuals that had applied for senior reactor operator (SRO) licenses. All three individuals were currently licensed as reactor operators (RO's), therefore, they were all administered SRO upgrade examinations. The examinations were administered in accordance with NUREG 1021, Rev. 5, "Operator Licensing Examination Standards."

The written examination administered was a prototype of the new format that will be administered after January 1, 1990. The licensee's training department was made aware of the new format well in advance of the examination being given. The new format consisted of a 100 point examination with a 4½ hour time limit. The new format also consisted mostly of objective type (multiple choice, matching, or fill-in-the-blank) questions. A review of the written examination was conducted with licensee representatives as indicated on Attachment 1 on October 23, 1989. This review was performed one day before the written examination was administered. All licensee representatives that participated in the written examination review were under a security agreement not to divulge examination content prior to the examination being administered to the applicants. The purpose at this pre-examination review was to ensure that the questions were written concisely, avoided ambiguities, and were specific to the licensee's facility. The licensee representatives had several comments or suggestions. The NRC examination team incorporated all beneficial comments or suggestions into the written examination prior to its administration to the applicants.

1.2 Requalification Program Evaluation

During the examination period the NRC administered requalification examinations to 12 licensed operators (6 ROs and 6 SROs). Two on-shift crews and one staff crew were evaluated. The examiners used the process and criteria described in NUREG 1021, "Operator Licensing Examiner Standards," Rev. 5., Section ES-601, "Administration of NRC Requalification Program Evaluations."

An entrance meeting was held with the licensee on August 31, 1989, in the Regional Office. The purpose of this meeting was to brief the licensee on the requirements of the requalification program evaluation and to outline a prospective schedule for the examinations.

1.3 BWR Power Oscillation Program Inspection

An inspection was conducted at the Vermont Yankee Nuclear Power Station during the weeks of October 23, 1989 and November 6, 1989. The inspector evaluated the licensee's response to and implementation of NRC Bulletin (NRCB) 88-07 and Supplement 1 to this bulletin. The bulletin addressed power oscillations in boiling water reactors (BWRs). The licensee's responses to the bulletin and the supplement are contained in Vermont Yankee Nuclear Power Corporation letters FVY 88-79, dated September 16, 1988 and BVY 89-24, dated March 6, 1989. Temporary Instruction 2515/99, "Inspection of Licensee's Implementation of Requested Actions of Bulletin 88-07, Power Oscillations," was used to conduct this inspection. The licensee personnel who provided substantial information during this inspection are noted in Attachment 1.

2. LICENSED OPERATOR REPLACEMENT EXAMINATION

2.1 Replacement Examination Results

The NRC examiners administered complete initial replacement examinations for three (3) SRO upgrade applicants. The examinations were administered in accordance with NUREG 1021, Rev. 5., "Operator Licensing Examiner Standards," dated January 1, 1989. The results are summarized below:

	SRO Pass/Fail
Written	3/0
Operating	3/0
Overall	3/0

2.2 Written Examination Findings/Conclusions

The following is a summary of generic strengths and deficiencies noted from the grading of the written examinations. This information is being provided to aid the licensee in upgrading licensee and requalification training programs. No licensee response is required.

Strengths

All questions that are not listed below as a deficiency were answered correctly by at least 2 of 3 applicants. Although all questions not listed below cannot be considered generic strengths, they do indicate satisfactory general knowledge in those areas.

Deficiencies

The questions listed below were answered incorrectly by at least 2 of the 3 applicants.

Question 5.08: Knowledge of all immediate actions for OT-3120, "Condenser Low Vacuum."

5.09: Knowledge of all immediate actions for OT-3147, "Loss of RBCCW."

5.19: Knowledge that OE-3104, Torus Temperature and Level Control leg allows for actions to be taken to protect containment, irrespective of core cooling.

5.27: Ability to determine required actions in accordance with technical specifications when MCPR safety limit is exceeded.

5.32: Knowledge of power supplies to various 4160V AC loads.

5.34: Knowledge of Emergency Plan requirements concerning public notification.

5.40: Knowledge of the technical specification bases for not allowing power operation in the natural core circulation mode.

6.01: Knowledge of the theory of operation, power supply, and initiation logic for the back-up scram valves.

6.05: Knowledge of the purpose of the jet pump assemblies and the core plate.

6.06: Ability to predict the plant response for an inadvertent HPCI initiation at power.

6.13: Knowledge of the technical specification bases for the RPV pressure safety limit.

6.22: Ability to state 6 conditions that require a radiation work permit.

2.3 Operating Examination Findings/Conclusions

The following is a summary of generic strengths and deficiencies noted on the operating tests (dynamic simulator and/or plant walk-through). This information is being provided to aid the licensee in upgrading licensee and requalification training programs. No licensee response is required.

Strengths

- All applicants performed well on the implementation of the emergency operating procedure and other plant procedures.
- All applicants had a good understanding of the emergency plan.
- All applicants displayed good supervisory (command and control) skills.

Deficiencies

- Although all applicants displayed satisfactory ability to use and interpret technical specifications, generally they were weak and displayed a lack of familiarity with certain sections of the technical specifications. The licensee's training program did not ensure that all SRO applicants were well versed in their ability to use and interpret technical specifications.

2.4 Training Program Comments

Overall, all the applicants performed well on most portions of the examination. There were relatively few generic deficiencies noted, indicating that the training department prepared the applicants well for the licensing examinations.

3. REQUALIFICATION PROGRAM EVALUATION

3.1 Requalification Examination Results

The NRC examined six SROs and six ROs. Examinations were administered in accordance with NUREG 1021, Rev. 5. "Operator Licensing Examiner Standards," dated January 1, 1989. The results are summarized below along with the facility's results.

NRC Grading	RO Pass/Fail	SRO Pass/Fail	TOTAL Pass/Fail
Written	6/0	6/0	12/0
Simulator	6/0	6/0	12/0
Walk-Through	6/0	6/0	12/0
Overall	6/0	6/0	12/0

Facility Grading	RO Pass/Fail	SRO Pass/Fail	TOTAL Pass/Fail
Written	6/0	6/0	12/0
Simulator	6/0	6/0	12/0
Walk-Through	6/0	6/0	12/0
Overall	6/0	6/0	12/0

3.2 Individual Strengths and Deficiencies

The following is a summary of generic strengths and deficiencies noted by the NRC from the results of the individual requalification examinations. This information is being provided to aid the licensee in upgrading the requalification training program. No licensee response is required.

Strengths

- Shift Supervisors displayed good supervisory (command and control) skills

- Generally, control board manipulation was good

Deficiencies

- Inability to correctly read torus level off back-panel indication

- Inability of Shift Engineers (non-licensed) to provide accurate reactor vessel/containment parameters to Shift Supervisor

3.3 Program Strengths and Deficiencies

The following is a summary of generic strengths and deficiencies noted during the evaluation. This information is being provided to aid the licensee in upgrading the requalification training program. No licensee response is required.

Strengths

- Well-coordinated program; judicious use of training staff and facility evaluators

Deficiencies

- JPMs had numerous, attention-to-detail flaws:

  1) The same candidate performed two JPMs dealing with Standby Liquid Control and was asked duplicate JPM questions.

  2) Candidates gave un-anticipated, yet technically correct answers to some JPM questions.

  3) Numerous JPM questions had no reference cited in the answer key.

  4) The answer key for one JPM question was wrong.

  5) Some JPMs had superfical critical steps

3.4 Requalification Program Evaluation Results

The facility program for licensed operator requalification training was evaluated based on the criteria of ES-601, Paragraphs C.3.b.(1), C.3.b.(2), D.1.c.(2)(c), D.2.c.(2)(b) and D.3.c.(2)(b).

3.4.1 Requalification Program Requirements

The review of the licensee's procedures for conduct of licensed operator training indicated that the requalification program meets the requirements of 10 CFR 55.59(c)(2), (3) and (4) for lectures, on-the-job training and evaluations. The program is also based on a Systems Approach to Training (SAT) and, therefore, meets the criteria of ES-601, paragraph C.3.b.(1)(d).

3.4.2 Examination Results

On an individual basis, 100% of the operators passed the overall examination as graded by the NRC which meets the criteria of 75% established in ES-601, paragraph C.3.b.(1)(b).

All three of the crews were determined to be satisfactory by the NRC and the facility which satisfies the criteria for the simulator evaluation provided in ES-601, paragraph D.1.c.(2)(c)(4). For a program to be judged satisfactory, no more than one third of the crews may be evaluated as unsatisfactory by the NRC.

All of the individual operators passed the walk-through examination which satisfies the criteria of 75% established in ES-601, paragraph D.2.c.(2)(b)(2).

With respect to the written examination, 100% of the operators passed as graded by the NRC (100% as graded by the facility) which meets the criteria of ES-601, paragraph D.3.c.(2)(b) that at least 75% of the operators must pass the examination for the program to be judged satisfactory.

3.4.3 Agreement on Pass/Fail Decisions

There was 100% agreement between the NRC and the facility on pass/fail decisions on the overall examination which meets the criteria of 90% established in ES-601, paragraph C.3.b.(1)(a).

Both the NRC and the facility found all the crews satisfactory on the simulator evaluations and therefore the criteria of ES-601, paragraph D.1.c.(2)(c)1. was met.

The final results of the individual simulator evaluations were identical between the NRC and the facility grading which meets the criteria for 90% pass/fail decision established in ES-601, paragraph D.1.c.(2)(c)2.

There was 100% agreement between the NRC and the facility on pass/fail decisions on the walk-through examinations which meets the criteria of 90% agreement from ES-601, paragraph D.2.c.(2)(b)(1).

3.4.4 Common Job Performance Measures

None of the common JPMs were missed by at least 50% of the examinees; therefore, paragraph c.3.b.(2)(a) of ES-601 does not apply.

Ten (or 83.3%) of the examinees correctly answered at least 80% of the common JPM questions which meets the criteria of ES-601, paragraph C.3.b.(2)(e) that at least 75% of the examinees score over 80% on the common JPM questions. The remaining two examinees answered greater than 70% of the common JPM questions correctly.

3.4.5 Licensed Operator Training

The results of the requalification examinations and review of the requalification program indicated that the facility trains and evaluates operators in all positions permitted by their individual licenses; therefore, paragraph C.3.b.(2)(c) of ES-601 is not applicable.

The facility had trained operators for the in-plant JPMs as evidenced by the 100% pass rate on the walk-through examination; therefore, paragraph C.3.b(2)(d) of ES-601 is not applicable.

3.4.6 Facility Evaluators

All of the facility evaluators were found to be satisfactory in accordance with the standards established in Attachment 5 to ES-601; therefore, paragraph C.3.b.(2)(f) of ES-601 does not apply.

3.4.7 Summary of Results

The Vermont Yankee licensed operator training program was evaluated as satisfactory. The program met all the criteria of ES-601, paragraph C.3.b.(1) for a satisfactory program. Additionally, the program met all criteria for the simulator, walk-through, and written portions of the evaluations. These criteria are described in ES-601, paragraphs D.1.c.(2)(c), D.2.c.(2)(b), and D.3.c.(2)(b).

4. BWR POWER OSCILLATION PROGRAM INSPECTION

The inspector reviewed lesson plans for operator training and determined that the training material properly addressed the power oscillation issue as requested by NRCB 88-07. Training was conducted for all licensed operators and shift engineers in a timely fashion. The training material developed includes: LOT-06-401, "Industry Events"; LOR 88.5-310, "Boiling Heat Transfer, 2 Phase Flow, La Salle"; LOR 89.1-502, "Responses"; and LOR 89.2-502, "Responses." The licensed operators and shift engineers were made aware of procedure changes and developments resulting from the implementation of the requested actions of NRCB 88-07 and Supplement 1 via formal classroom training by the training department.

The inspector noted one deficiency with respect to the content of the training department's lesson plans. One of the lesson plans, LOR 88.5-310, "Boiling Heat Transfer, 2 Phase Flow, LaSalle," contains out-of-date information and requires revision. The training department procedures contain no requirement for periodic review of lesson plans or training material. The only mechanism for revising lesson plans or training material is for the instructor to review the material before giving training and performing revisions as needed. The licensee has agreed to revise procedure TDD-24 (Training Material Development) to include a requirement for lesson plans and training materials to be reviewed for required revisions prior to their use. As of November 13, 1989, this procedure review requirement has been incorporated into the training program.

The inspector interviewed six licensed operators and two shift engineers to determine their knowledge of power oscillations and procedural guidance to detect and mitigate a power oscillation transient. All operators interviewed were knowledgeable of the methods to perform normal power changes to avoid regions of potential instability on the power-to-flow map. Also, given that they were operating in the restricted zone, most of the individuals know how to exit the restricted zone and actions required to mitigate power oscillations if they do occur.

However, the majority of the individuals that were interviewed did not know the exact entry conditions and all the immediate actions, specifically, all indications of power oscillations of OT 3117, (Reactor Instability). Operators are required to know from memory the entry conditions, immediate operator actions, and the reasons/bases for notes and cautions for all "OT" procedures. This knowledge deficiency with respect to OT 3117 (Reactor Instability), is especially significant since the licensee elected to develop OT-3117 (Reactor Instability) as the procedure to be entered for guidance on power oscillations any time regions I or II of the power-to-flow map is entered. The licensee elected not to revise all the procedures that may result in operation in regions I or II to include cautions for instability since the operator is to refer to OT-3117 (Reactor Instability) any time region I or II is entered. Without OT-3117 (Reactor Instability), there is no other procedural guidance for these types of events.

The licensee has agreed to include OT-3117 (Reactor Instability) in Cycle 1 of 1990 requalification training. This training is to ensure that all operators are fully knowledgeable of the entry conditions and the immediate actions of OT-3117 (Reactor Instability). This item will remain unresolved pending completion of the licensee's corrective actions (UNR 50-271/89-18-01). The inspector noted several other minor knowledge deficiencies as a result of these interviews. The licensee has been made aware of these and has agreed to correct these minor deficiencies in future training sessions.

The inspector reviewed the licensee's procedures to verify that they provided adequate symptoms of power oscillations, cautions to avoid potentially unstable operating situations, and actions to terminate power oscillations if they do occur. The licensee had previously performed an in-depth review of all their procedures and determined that four procedures required revisions to address the power oscillation issue. Procedures OP-0102 (Power Operation), OP-2110 (Reactor Recirculation), OP-3147 (Loss of RBCCW), and OT-3118 (Recirculation Pump Trip) were revised. Additionally, the licensee determined that a new procedure was also required and generated OT-3117 (Reactor Instability). The inspector concluded that all the procedures that were revised or generated by the licensee were adequate to address the power oscillation issue. The inspector had no further questions in the procedural area.

Overall, the licensee adequately implemented the requested actions of NRC Bulletin 88-07 and Supplement 1. Specifically, the knowledge deficiencies listed above are a concern and indicate that the licensee's process for ensuring that licensed operators fully understand major procedure changes may not be completely effective.

ATTACHMENT 1

Persons Contacted

1. Vermont Yankee Nuclear Power Corporation

W. Murphy, Vice President and Manager of Operations	(2)
J. Herron, Operations Supervisor	(2)
L. Doane, Assistant Operations Supervisor	(1)
J. Durborow, Operations Engineer	(6)
R. Spinney, Training Manager	(2)
G. LeClair, Operations Training Supervisor	(1,2,6)
A. Chesley, Simulator Supervisor	(2)
F. Helin, Project Engineer	(6)
W. Shulze, Operations Training Instructor	(1,2,3,5)
M. Sontag, Operations Training Instructor	(2,6)
J. Brister, Operations Training Instructor	(1)
S. Brown, Operations Training Instructor	(5)
G. Duffy, Operations Training Instructor	(5)

2. U.S. Nuclear Regulatory Commission (NRC)

R. Gallo, Chief, Operations Branch, DRS	(1)
R. Conte, Chief, BWR Section, OPS Branch, DRS	(1)
H. Williams, Senior Operations Engineer	(1,5)
T. Fish, Senior Operations Engineer	(1,2,3)
N. Conicella, Operations Engineer	(2,3,4,5)
T. Easlick, Operations Engineer	(1)
C. Sisco, Operations Engineer	(1)
T. Lipuma, Auditor, OIG	(1)
R. Donovan, Auditor, OIG	(1)
R. Miller, Licensed Operator Examiner	(3,4)
M. Daniels, Licensed Operator Examiner	(3)

Notes:
(1) Attended entrance meeting on August 31, 1989
(2) Attended exit meeting on November 9, 1989
(3) Member of the NRC requalificatin examination team
(4) Member of the NRC replacement examination team
(5) Attended replacement written examination pre-exam review
(6) Provided input for BWR power oscillation inspection

<u>ATTACHMENT 2</u>

Replacement Master Exam

ATTACHMENT 2

Master

Nuclear Regulatory Commission
Operator Licensing
Examination

This document is removed from
Official Use Only category on
date of examination.

U. S. NUCLEAR REGULATORY COMMISSION
SENIOR REACTOR OPERATOR LICENSE EXAMINATION

FACILITY: VERMONT YANKEE

REACTOR TYPE: BWR-GE4

DATE ADMINSTERED: 89/10/24

CANDIDATE: ______________

INSTRUCTIONS TO CANDIDATE:

Use separate paper for the answers. Write answers on one side only. Staple question sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires at least 70% in each category and a final grade of at least 80%. Examination papers will be picked 4 1/2 hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE	CATEGORY
60.00	60.00	N/A	N/A	5. EMERGENCY AND ABNORMAL PLANT EVOLUTIONS
40.00	40.00	N/A	N/A	6. PLANT SYSTEMS AND PLANT-WIDE GENERIC RESPONSIBILITIES
96.00 ~~00.00~~		______ FINAL GRADE	______%	TOTALS

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

____
Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

ring the administration of this examination the following rules apply:

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

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

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

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

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

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

. You should write your answers on the examination question page. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

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

. Print your name in the upper right-hand corner of the first page of each section of your answer sheets. Initial each page.

. If you are using separate sheets, number each answer as to category and number (i.e. 1.04, 6.10). Use one separate sheet per answer.

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

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

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

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

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

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

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

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

. There is a time limit of 4½ hours for completion of the examination.

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

QUESTION 5.01 (1.00)

Caution #10 on OE 3100,"SCRAM", warns the operator against inhibiting ECCS operation unless "adequate core cooling" is assured. SELECT the correct definition of "adequate core cooling" from the choices below. [1.0]

a. Systems available and operating to remove the sensible and decay heat during a postulated Loss of Coolant Accident.

b. Water level is above ~~the top~~ 2/3 of active fuel.

c. Systems available to maintain peak fuel cladding temperature below 2500 degrees F.

d. The fuel is at or below the Linear Heat Generation Rate [LHGR] as stated in the technical specifications.

ANSWER 5.01 (1.00)

~~b~~. a. [1.00]

REFERENCE

1. LOT 9-001 SCRO Obj. A.4 & B.3
2. none
3. K/A 295031 K1.01/4.7 , A2.04/4.8
295031A204 295031K101 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.02 (1.00)

OE 3102, 2/2," RPV LEVEL CONTROL", directs the operator to use alternate means of depressurization if the suppression pool is below 6 feet. SELECT the reason for this requirement. [1.0]

a. At 6 feet, level is below the suppression pool temperature detectors resulting in inaccurate temperature readings.

b. With level below 6 feet, there is insufficient heat capacity to prevent containment overpressurization.

c. With level below 6 feet, the SRV discharge piping is uncovered.

d. The bottom of the downcomers are at 6 feet.

ANSWER 5.02 (1.00)

c. [1.00]

REFERENCE

1. LOT 9-009 SCRO Obj. A.2
2. none
3. K/A 295030 K2.08/3.8
   295030K208 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.03 (1.00)

OE 3103, "Drywell emergency depressurization Pressure and Temperature Control", directs a reactor scram and ~~RPV cooldown~~ when Drywell temperature is above the RPV saturation curve. During this ~~cooldown~~ the operator is directed to flood the RPV. SELECT the correct BASES for flooding the RPV under these conditions from the choices below.

a. This step anticipates losing the steam driven means for filling the RPV during a depressurization and ensures an adequate inventory prior to that point.

b. This step assures that drywell temperature will not reach 280 degrees F by filling the RPV with relatively cool water to complete depressurization as soon as possible reducing the heat load on the drywell.

c. This step assumes that RPV level indication is not valid due to the high drywell temperature and requires flooding to assure adequate core cooling.

d. This step assumes that the system will not be available for suppression pool cooling due to operation in the LPCI mode and so requires flooding to reduce the heat load on the drywell. [1.0]

ANSWER 5.03 (1.00)

c. [1.00]

REFERENCE

1. LOT 9-008 SCRO Obj. A.2
2. OE 3103
3. K/A 295028 K2.03/3.8, G012/3.8, K3.02/4.3
   295028K203 295028G012 295028K302 ..(KA's)

QUESTION 5.04 (1.00)

Actions to mitigate reactor power oscillations at high power/low flow conditions are taken to prevent exceeding which of the following thermal limits? [1.0]

a. MCPR [Minimum Critical Power Ratio]

b. LHGR [Linear Heat Generation Rate]

c. APLHGR [Average Planar Linear Heat Generation Rate]

d. MAPLHGR [Maximum Average Planar Linear Heat Generation Rate]

ANSWER 5.04 (1.00)

a. [1.00]

REFERENCE

1. LOT 9-005 SCRO Obj. B.12
2. none
3. K/A 295001 K1.04/3.3
   295001K104 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.05 (1.00)

While operating at 90% power the STATOR CLG RUNBACK alarm annunciates.
Conditions after the runback are as follows:

Stator Cooling Water	Inlet Pressure	10 psig
" " "	Outlet Temperature	90 degrees C
" " "	Conductivity	8 umhos/cm
Generator Stator Current		4350 amps

SELECT the ONE correct statement from those below: [1.0]

a. The load on the main generator must be reduced below 25% in 90 seconds or the main turbine will trip.

b. The main turbine will automatically trip after 180 seconds.

c. The main turbine will automatically trip after 90 seconds unless stator cooling water outlet temperature is reduced below 86 degrees C.

d. The main turbine will automatically trip if the stator cooling conductivity reaches 10 umho/cm.

ANSWER 5.05 (1.00)

b. [1.00]

REFERENCE

1. LOT 9-005 SCRO Obj. A.2, A.3, B.11
2. none
3. K/A 295005 G05/3.6, G11/4.1
   295005G005 295005G011 ..(KA's)

QUESTION 5.06 (1.00)

SELECT the correct bases for requiring a reactor scram with no Control Rod Drive [CRD] System flow/pressure with the reactor pressure below 800 psig and 2 or more Accumulator Low Pressure Alarms. [1.0]

a. The reactor is scrammed in anticipation of tripping both recirculation pumps due to the potential seal damage from loss of CRD flow.

b. The reactor is scrammed before possible CRD overheating can affect the mechanism seals and impact on individual control rods scram times causing them to exceed technical specification time limits.

c. The reactor is scrammed to ensure there is no loss of scram capability ~~from discharging accumulators~~.

d. The reactor is scrammed since no other control rod motion is available [insert/withdraw] without the CRD system in operation.

ANSWER 5.06 (1.00)

c. [1.00]

REFERENCE

1. LOT 2-009 SCRO Obj. 29
2. none
3. K/A 295002 K3.08/3.9, G008/3.8, G003/3.9
   295002G003 295002G008 295002K301 ..(KA's)

QUESTION 5.07 (1.00)

The unit is operating in COLD SHUTDOWN with the 'A' loop of RHR in Shutdown Cooling and the 'B' loop inoperable due to a problem with RHR Service Water. The operating loop of RHR becomes inoperable due to a problem with the heat exchanger. In accordance with ON 3156,"Loss of Shutdown Cooling", Which ONE of the following is an acceptable means of circulation? [1.0]

a. Maintaining RPV level to establish a natural circulation flowpath.

b. Establishing a 'feed and bleed' flowpath with the Condensate System and Main Steam Line drains.

c. Establishing a 'feed and bleed' flowpath with CRD flow and RWCU letdown.

d. Establishing a 'feed and bleed' flowpath with Core Spray and RWCU letdown.

Delete Question

ANSWER 5.07 (1.00)

c. or d. [1.00]

REFERENCE

1. LOT 9-003 SCRO Obj. 28
2. ON 3156
3. K/A 295021 G008/3.7, G011/3.9, K1.04/3.8
295021G011 295021K104 295021G008 ..(KA's)

QUESTION 5.08 (1.50)

The unit is operating at full power when the operator notices a lowering main condenser vacuum. STATE the THREE [3] IMMEDIATE OPERATOR ACTIONS as delineated in OT 3120,"CONDENSER LOW VACUUM". [1.5]

ANSWER 5.08 (1.50)

a. Start any idle circ. water pumps, circ water booster pumps or cooling tower fans as required. [0.5]

b. If the cause cannot be immediately determined reduce reactor power as necessary to maintain backpressure below 5 inches Hg Abs. [0.5]

c. Check steam seal pressure. If low, open the steam seal regulator feed valve, MS-6 if closed. [0.5]

REFERENCE

1. LOT 9-002 SCRO Obj. A.2
2. OT 3120
3. K/A 295002 G010/3.7
   295002G010 ..(KA's)

QUESTION 5.09 (1.50)

ON 3147, "Loss of RBCCW", requires that RBCCW flow be restored within two minutes or the Reactor Operator ACTIONS of ______________________, ______________________, and ______________________ will be taken. [1.5]

ANSWER 5.09 (1.50)

a. shift station loads to the startup transformer [0.50]

b. scram the reactor [0.50]

c. trip both recirc pumps [0.50]

REFERENCE

1. LOT 9-002 SCRO Obj. C.19
2. ON 3147
3. K/A 295012 A1.02/3.8, G011/4.4
   295012G011 295012A102 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.10 (1.00)

ON 3146,"Low Instrument/Scram Air Header Pressure", requires a manual scram if scram air pressure drops below 55 psig and can not be restored. Which of the following is the basis for this scram? [1.0]

a. Scram Discharge Volume inleakage from the drifting open of the scram inlet and outlet valves could prevent a scram later.

b. An early scram allows the operator to direct his attention to other plant satety related equipment being affected by the loss of air.

c. The scram eliminates the undesirable effects of the irregular rod pattern from random rod insertion.

d. Establishes stable plant condition, especially within the Control Rod Drive Hydraulic system, should Instrument Air be restored rapidly.

ANSWER 5.10 (1.00)

c. [1.00]

REFERENCE

1. LOT 9-003 SCRO Obj. B.3
2. ON 3146
3. 295019 G010/3.4, A2.02/3.7, K2.01/3.9
   295019A202 295019K201 295019G010 ..(KA's)

QUESTION 5.11 (1.50)

OE 3105,"Secondary Containment Control", requires isolating all systems discharging into an area that exceeds its maximum temperature except systems required to ________________________ or necessary to ________________________ or necessary to ____________________.

FILL in the BLANKS. [1.5]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.11 (1.50)

Isolate all systems discharging into the area except systems:
a. required to shutdown the reactor [0.50]
b. necessary to assure adequate core cooling [0.50]
c necessary to suppress a fire [0.50]

REFERENCE

1. LOT 9-012 SCRO Obj. A.2
2. OE 3105
3 K/A 295032 K2.03/3.4, K2,08/3.9
295032K203 295032K208 ..(KA's)

QUESTION 5.12 (3.00)

For the reactor water level instrumentation listed below [a] STATE its SPECIFIC PURPOSE and [b] GIVE the RANGE of MEASUREMENT. [3.0]

1. Rosemont level instrument (LI-2-3-58) Panel 9-5
2. Shutdown level GEMAC (LI-2-3-61) Panel 9-4
3. Wide range level GEMAC (LR-2-3-70) Panel 9-5

ANSWER 5.12 (3.00)

1.a. Provides trip functions associated with level [0.5]
b. +77" [0.25] to +177" [0.25] [0.5]

2.a. Provides indication during vessel flooding on cooldown [0.5]
b. +70" [0.25] to +470" [0.25] [0.5]
570" when shutdown with head removed

3.a. Provides permanent record of reactor water level for technical specification safety limit of 12" [0.5]
b. +200" [0.25] to -200" [0.25] [0.5]

REFERENCE

1. LOT 3-002 SCRO Obj. 1 & 3
2. none
3. K/A 295031 A2.04/4.6
   295031A204 ..(KA's)

QUESTION 5.13 (1.00)

In accordance with technical specifications with the reactor shutdown, minimum allowable water level in the reactor vessel is ___________. [1.0]

ANSWER 5.13 (1.00)

12" (above TAF) [1.00]

REFERENCE

1. LOT 9-002 SCRO Obj. 3 & 4
2. TS 1.1.D
3. K/A 295031 K1.01/4.7
   295031K101 ..(KA's)

QUESTION 5.14 (1.00)

You are supervising fuel loading operations. While a fuel assembly is being transported using the refuel bridge, you notice the reactor cavity water level is decreasing. Which of the following describes your directions to the operator of the refuelling bridge? [1.0]
Assume bundle is suspended in fuel pool and no ARMs have alarmed.

a. Immediately vacate the refuel floor

b. Place the fuel assembly in the nearest available core location

c. Place the fuel assembly in the nearest fuel storage location

d. Stop fuel movement and investigate the cause of the water level decrease

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.14 (1.00)

c. [1.0]

REFERENCE

1. none
2. OP 1101,"Management of Refuelling Activities and Fuel Assembly Movement"
3. K/A 295023 G010/3.9
   295023G010 ..(KA's)

QUESTION 5.15 (1.00)

Which of the following is NOT a symptom of jet pump failure. [1.0]

a. A decrease in indicated core flow.

b. A decrease in reactor power.

c. A decrease in steam flow.

d. A decrease in core plate delta P indication.

ANSWER 5.15 (1.00)

a. [1.0]

REFERENCE

1. LOT 9-002 SCRO Obj. A.1
2. ON 3141
3. K/A 295001 A2.05/3.4
   295001A205 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.16 (3.50)

Based only on the conditions listed in Column A, CHOOSE from Column B all the Operational Emergency Procedures which would be entered. Assume reactor power is 100% rated unless otherwise stated. [3.5]

COLUMN A [Conditions]

a. Reactor Bldg. Vent Exhaust Rad Level reads 10 mR/hr

b. Torus water volume is 70,500 cubic feet

c. Drywell pressure is 2.5 psig and reactor power is 10%

d. RPV level is 125" and slowly decreasing.

COLUMN B [Procedure]

1. OE 3100, "SCRAM"

2. OE 3101, "Reactivity Control"

3. OE 3102, "PRV Level Control"

4. OE 3103, "Drywell Pressure and Temperature. Control"

5. OE 3104, "Torus Temperature and Level Control"

6. OE 3105, "Secondary Containment Control"

7. None

ANSWER 5.16 (3.50)

a. None 7	[0.5]
b. OE 3104 5	[0.5]
c. OE 3100, OE 3101, OE 3103 1,2,4	[1.50]
d. OE 3102, OE 3100 1,3	[1.00]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

1. LOT 9-001 SCRO Obj. A.1 & A.3
   " 9-008 " " " "
   " 9-009 " " " "
   " 9-010 " " " "
   " 9-011 " " " "
2. OE 3100, 3101, 3102, 3103, 3104, 3105
3. K/A 295029 G011/4.5, 295033 G011/4.5, 295024 G011/4.5
   295024G011 295029G011 295033G011 ..(KA's)

QUESTION 5.17 (3.00)

List SIX [6] IMMEDIATE ACTIONS that must be taken per ON 3126,"Alternate Shutdown from Outside the Control Room", if time allows, before evacuating the control room. [3.0]

ANSWER 5.17 (3.00)

a. Declare a Site Area Emergency over the Page [0.50]
b. Runback recirc pumps to minimum [0.50]
c. Manually scram the reactor [0.50]
d. Close at least one MSIV per steam line [0.50]
e. Open HPCI-24 [0.50]
f. Place ADS bypass switch to BYPASS [0.50]
g. Take Portable radios for distribution per Appendix A [0.50]

REFERENCE

1. LOT 9-013
2. ON 3126
3. K/A 295016 G010/3.6
   295016G010 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.18 (2.00)

For an unexpected positive reactivity insertion with cause listed in Column A, MATCH the IMMEDIATE OPERATOR ACTIONS from Column B as given in OT 3110,"Positive Reactivity Insertion". Assume the reactor is at 100% power prior to the positive reactivity insertion. [2.0]

Delete Question

COLUMN A

a. Control Rod 20-21 drops from position 00 to position 36

b. RCIC inadvertantly injects

c. A feedwater heater isolates

d. Control Rod 18-31 drifts from position 00 to position 26

COLUMN B

1. Reduce recirculation flow to reduce power below pre-transient power level

2. Reduce power by 25% with recirculation flow

3. Reduce recirculation flow to minimum and notify management

4. Select Control Rod and apply single insert

5. Verfy RPV level and drywell pressure

6. No action required

ANSWER 5.18 (2.00)

a. 3 [0.50]
b. 5 [0.50]
c. 2 [0.50]
d. 3 [0.50]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

1. LOT 9-006 SCRO Obj. A.2 & B.2
2. OT 3110
3. K/A 295014 G001/3.9, G010/3.9
   295014G010 295014G001 ..(KA's)

QUESTION 5.19 (1.00)

Which of the following procedures allows actions to be taken irrespective of adequate core cooling if conditions warrent. [1.0]
CHOOSE ONE

a. OE 3103,"Drywell Pressure and Temperature Control" D/W Temperature leg

b. OE ~~3108~~ 3104, "Torus Temperature and Level Control ~~Drywell Pressure and Temperature Control~~" Torus Level leg

c. OE ~~3108~~ 3104, "Torus Temperature and Level Control ~~Drywell Pressure and Temperature Control~~" Torus Temperature leg

d. OE 3105,"Secondary Containment Control" Area Radiation level leg

ANSWER 5.19 (1.00)

b. [1.00]

REFERENCE

1. LOT 9-008 SCRO Obj. A.2, A.3, B.7, and B.10
2. OE 3103, OE 3105
3. K/A 295024 K2.15/3.9, K2.04/4.1
   295024K304 295024K215 ..(KA's)

QUESTION 5.20 (1.00)

The technical specification temperature limit on the suppression pool is set by... [CHOOSE ONE] [1.0]

a. Humbolt Bay test conducted in 1960

b. Long term decay heat removal

c. DBA-LOCA analysis

d. ATWS analysis

ANSWER 5.20 (1.00)

c. [1.0]

REFERENCE

1. LOT 3-205 SCRO Obj. 1
2. none
3. K/A 295026 G004/4.1
   295026G004 ..(KA's)

QUESTION 5.21 (3.00)

MATCH the reactor pressure setpoint in Column A with its associated condition in Column B. [3.0]

COLUMN A [psig]	COLUMN B [Condition]
a. 1055	1. 110% RPV design pressure
b. 1080	2. Two reliefs open
c. 1150	3. RPV SAFETY LIMIT
d. 1240	4. Two safeties open
e. 1250	5. RPT/ARI
f. 1335	6. RPV design pressure
	7. 120% Recirculation System design pressure
	8. One relief opens
	9. Recirculation System design pressure
	10. RPS scram setpoint

ANSWER 5.21 (3.00)

a. 10
b. 8
c. 5
d. 4
e. 6
f. 3

[0.50 each]

REFERENCE

1. LOT 3-002 SCRO Obj. 3
2. none
3. K/A 295025 K1.05/4.7
295025K105 ..(KA's)

QUESTION 5.22 (2.50)

The 'A' diesel generator was operating fully loaded during a routine surveillance test and tripped. The electrical bus remained energized after the diesel generator tripped. LIST Five [5] signals that could have tripped the emergency diesel.

[2.5]

ANSWER 5.22 (2.50)

a. Jacket coolant high temp
b. " " low pressure
c. Low lube oil pressure
d. High crankcase pressure
e. Engine overspeed
f. Manual

[0.50 each for 5 signals]

REFERENCE

1. LOT 5-209 SCRO Obj. 16
2. none
3. K/A 295003 A1.02/4.3
295003A102 ..(KA's)

QUESTION 5.23 (1.00)

OE 3105,"Secondary Containment Control", requires a rapid depressurization of the RPV if the maximum safe operating temperature is exceeded for a "limiting combination" of areas. SELECT the ONE correct bases for this ~~depressization~~ depressurization [1.0]

a. Based on rejecting the energy from the RPV to the suppression pool before pool temperature reaches design limits from other sources.

b. Based on the potential for unreliable operation of safety related equipment in areas that are beyond the maximum safe temperature limit and loss of secondary containment integrity.

c. Based on rejecting the energy from the RPV while SRV/Bypass valves are still available for a controlled rapid ~~depressization~~ depressurization.

d. Based on maintaining the steam driven HPCI and RCIC pumps available for makeup to the RPV as long as possible before depressurizing.

ANSWER 5.23 (1.00)

b.

REFERENCE [1.00]

1. LOT 9-012 SCRO Obj. A.2
2. OE 3105
3. K/A 295032 K3.01/3.8, G012/4.4
   295032K301 295032G012 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.24 (1.00)

The reactor has experienced an MSIV closure due to RPV level decreasing to 82.5 inches. Level has been subsequently restored. OE 3100,"Scram", allows reopening of the MSIV's if the main condenser is available. STATE the Two [2] conditions required to be met [given as Caution 27] prior to reopening the MSIV's. [1.0]

ANSWER 5.24 (1.00)

a. No indication of gross fuel failure [0.50]
b. No indication of a main steam line break "

REFERENCE

1. LOT 9-001 SCRO Obj. A.4, B.2, & B.3
2. OE 3100
3. K/A 295020 A2.06/3.8, G012/4.1, K1.01/3.9
295020K101 295020G012 295020A206 ..(KA's)

QUESTION 5.25 (1.50)

OE 3101,"Reactivity Control", Step RC/P-6 under Pressure Control states "Control Reactor Pressure Below 1055 psi UNLESS Depressurization is required..." STATE the pressure range to be maintained and the basis for this range. [1.5]

ANSWER 5.25 (1.50)

a. Range 950 to 1055 psig [0.50]
b. Basis: Maintain pressure high enough to keep turbine bypass valves open ~~[0.50]~~ but low enough to allow scram to be reset ~~[0.50]~~.
(1.0)

REFERENCE

1. LOT 9-011 SCRO Obj. A.2
2. OE 3101
3. K/A 295025 A2.01/4.3, G012/4.5
295025A201 295025G012 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.26 (3.00)

OE 3102,"RPV Level Control", describes the use of 'INJECTION SUBSYSTEMS' and 'ALTERNATE INJECTION SUBSYSTEMS' as a means to restore level. MATCH the subsystem in Column A with its appropriate plant system(s) from Column B. [3.0]

COLUMN A [Subsystem]	COLUMN B [Plant System]
a. INJECTION	1. SLC [test tank]
b. ALTERNATE INJECTION	2. Reactor Feedwater pumps
~~c. Not Classified as either subsystem~~	3. Core Spray
	4. RCIC
	5. Condensate
	6. Fire System using App. B

ANSWER 5.26 (3.00)

a. 3,5,2,4
b. 1,6
~~c. 2,4~~

REFERENCE

1. LOT 9-009 SCRO Obj. A.2
2. OE 3102
3. K/A 295031 A1.08/3.9
   295031A108 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.27 (1.00)

The unit is operating at full power when the Reactor Engineer reports to you that the Minimum Critical Power Ratio [MCPR] is 1.035. Your immediate action is to ... [CHOOSE ONE] [1.0]

a. insert rods per direction of the Reactor Engineer to increase MCPR to greater than 1.04.

b. insert rods per direction of the Reactor Engineer to increase MCPR to greater than 1.07.

c. no action is required since reactor pressure is greater than 800 psia and core flow is greater than 10% of rated.

d. commence a reactor shutdown.

ANSWER 5.27 (1.00)

d. [1.0]

REFERENCE

1. LOT 6-301 SCRO Obj. 33
   LOT 2-312 " " 14
2. none
3. K/A 295014 A2.05/4.4, A2.04/4,3, G008/4.6
   295014A204 295014A205 295014G008 ..(KA's)

~~QUESTION 5.28 (1.00)~~

~~OE 3104."Torus Temperature and Level Control", Step T/T-3 requires the operator establish torus cooling by normal methods if torus temperature is above 100 degrees F. What Two [2] CAUTIONS does the procedure identify when implementing this step? [1.0]~~

Delete Question

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.28 (1.00)

a. Caution 8: Observe NPSH requirements for pumps taking suction from the torus [0.50]

b Caution 18: If continuous LPCI operation of any RHR pump is required to assure adequate core cooling do not divert that pump from the LPCI mode [0.50]

REFERENCE

1. LOT 9-010 SCRO Obj. A.2 & A.3
2. OE 3104
3. K/A 295013 G007/3.8, K3.01/3.9, A1.01/3.5
295013K301 295013G007 295013A101 ..(KA's)

Delete Question

QUESTION 5.29 (1.00)

The plant is operating at 100% rated power, when a complete loss of Service and Instrument Air occurs. CHOOSE the ONE [1] statement below that describes expected system response. [1.0]

a. Scram Valves, CRD-126 and CRD-127 fail closed

b. RCIC Condensate Pump Discharge to Equipment Drain, RCIC-12 fails open

c. Diesel Oil Day Tank Fill Valves, FO-2A and FO-2B fail in the "as is" position

d. Primary/Secondary Torus Vacuum Breaker Valves AC-11A and AC-11B fail open

ANSWER 5.29 (1.00)

d. [1.00]

REFERENCE

1. LOT 9-003 SCRO Obj. B.3
2. none
3. 295019 K2.01/3.9, K2.16/2.8, K2.09/3.3
   295019K201   295019K216   295019K209   ..(KA's)

QUESTION   5.30   (2.50)

OT 3122,"Loss of Normal Power, Appendix A, Station Blackout", directs the operator to restore AC power immediately. What Five [5] emergency components are to be verified operating immediately? [2.5]

ANSWER   5.30   (2.50)

Verify the following emergency DC equipment is operating

a. Turbine Emergency Bearing Oil Pump
b. Emergency Seal Oil Pump
c. Recirc MG DC LO pumps
d. Emergency DC Lighting
e. Vital MG Set (shifted to DC drive)   [0.50 each]

REFERENCE

1. LOT 9-006 SCRO Obj. A.2
2. OT 3122
3. K/A 295003 A2.04/3.7, G010/4.1
   295003A204   295003G010   ..(KA's)

QUESTION 5.31 (1.00)

OE 3100,"Scram", and OE 3101,"Reactivity Control", have a CAUTION not to throttle HPCI and RCIC systems below 2200 RPM. CHOOSE ONE of the following statements that describes the reason for this caution. [1.0]

a. At lower turbine speeds, the resonance induced vibration can cause damage.

b. At lower turbine speeds, the turbine stop valve will not close fast enough.

c. Water hammer in the turbine exhaust line could damage the check valve

d. At lower turbine speeds the power to operate the turbine shaft-driven auxiliaries becomes excessive.

ANSWER 5.31 (1.00)

c. [1.00]

REFERENCE

1. LOT 9-001 SCRO Obj. A.4
2. OE 3100 & OE 3101
3. K/A 295006 G012/4.4, 295009 G012/4.4
   295006G012 295009G012 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.32 (2.00)

For the 4160 volt electric buses in Column A MATCH its loads [equipment] in Column B. [2.0]

COLUMN A [Buses]	COLUMN B [Load}
a. Bus 1	1. RHR PUMP C
b. Bus 2	2. Station Service Transformer 5B1-1A
c. Bus 3	3. Control Rod Drive Water Pump A
d. Bus 4	4. Circulating Water Pump A
	5. Fire Pump B
	6. Station Service Transformer 10
	7. Circulating Water Booster Pump C
	8. Core Spray Pump A
	9. No loads from this list

ANSWER 5.32 (2.00)

a. 4
b. 6
c. 1
d. 8 [0.50 each]

REFERENCE

1. LOT 5-208 SCRO Obj. 3
2. none
3. K/A 295003 K2.04/3.5
295003K204 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.33 (1.00)

The unit has just experienced a reactor scram on low RPV level due to the loss of all 3 Reactor Feedwater Pumps. Level reached 120 inches before being turned. OE 3100, "Scram", and OE 3102 1/2, "RPV Level Control", were both entered and level is now at 140 inches using the restarted "A" Reactor Feedwater Pump. Operator error causes the feedpump to trip once again and level rapidly decreases to 125 inches. SELECT the correct statement regarding the use of the EOP's from the choices below. [1.0]

a. The operator should continue on through OE 3102 attempting to restore level with other available systems.

b. The operator should go back and re-enter OE 3102 at the beginning.

c. The operator should exit OE 3102 and enter OT 3113, "Reactor Low Level".

d. The operator should continue on through OE 3102 after restoring the "A" Reactor Feedwater Pump.

ANSWER 5.33 (1.00)

b. [1.00]

REFERENCE

1. LOT 9-001 SCRO Obj. A.1 & A.3
2. OE 3100, OE 3102, OT 3113
3. K/A 295009 G011/4.5, G012/4.4
   295009G011 295009G012 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.34 (1.00)

Emergency Plan requirements concerni.; public notification include the capability to... [CHOOSE ONE] [1.0]

a. inform the public throughout the 5 mile EPZ within 10 minutes.

b. directly inform the public within 10 miles of the site.

c. assure all of the public knows of the emergency within 45 minutes.

d. provide information to the public in the 10 mile area within 15 minutes.

ANSWER 5.34 (1.00)

d. [1.0]

REFERENCE

1. LOT 6-307 SCRO Obj. 5
2. none
3. K/A 295038 K3.01/4.5
   295038K301 ..(KA's)

QUESTION 5.35 (1.00)

In accordance with OE 3101,"Reactivity Control", boron MUST be injected into the RPV ... [CHOOSE ONE] [1.0]

a. before the Torus temperature exceeds 110 degrees F.

b. after three scram attempts fail.

c. if a scram condition occurs and power is above 2%.

d. immediately if the MSIV's isolate

ANSWER 5.35 (1.00)

a. [1.0]

REFERENCE

1. LOT 9-011 SCRO Obj. A.1, A.2, B.1, B.5
2. OE 3101
3. K/A 295037 K3.02/4.5
   295037K302 ..(KA's)

QUESTION 5.36 (1.00)

The reactor is operating at 100% rated power when the "A" recirculation pump trips. In accordance with OT 3117,"Reactor Instability" and OT 3118,"Recirculation Pump Trip", you should scram the reactor. [CHOOSE ONE] [1.0]

a. Immediately if APRM oscillations of 5% rated flux peak to peak occur.

b. Immediately since the reactor is operating above the 80% rod line.

c. Immediately if three LPRM Upscale Alarms repeatily occur.

d. Immediately since core flow is less than 24 million pounds per hour.

ANSWER 5.36 (1.00)

c. [1.0]

REFERENCE

1. LOT 9-005 SCRO Obj. A.2
2. OT 3117, OT 3118
3. K/A 295001 K3.04/4.2, G011/3.7, G010/3.6E
   295001G010 295001G011 295001K304 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.37 (1.00)

OE 3105,"Secondary Containment Control", relates to control of secondary containment... [CHOOSE ONE}

[1.0]

a. pressure, temperature, and radiation levels.

b. temperature, radiation levels, and water levels.

c. radiation levels, water levels, and pressure.

d. water levels, pressure, and temperature.

ANSWER 5.37 (1.00)

b. [1.0]

REFERENCE

1. LOT 9-012 SCRO Obj. A.1
2. OE 3105
3. K/A 295032 G012/4.4, 295035 G012/4.1, 295036 G012/4.6
   295032G012 295036G012 295035G012 ..(KA's)

QUESTION 5.38 (1.00)

In accordance with OE 3102,"RPV Level Control", the "Minimum Alternate Flooding Pressure" ~~is~~ ... [CHOOSE ONE]

[1.0]

a. is the pressure at which the core is flooded by alternate means.

b. depend~~ent~~s ~~upon~~ on the number of open SRV's and 2/3's core coverage.

c. ~~independent of~~ does not depend on the SRV's and 2/3's core coverage.

d. depend~~ent~~s only on steam cooling for heat transfer.

ANSWER 5.38 (1.00)

d. [1.0]

REFERENCE

1. LOT 9-009 SCRO Obj. 5
2. OE 3102
3. K/A 295031 K1.01/4.7
   295031K101 ..(KA's)

QUESTION 5.39 (2.50)

For the isolations in Column A identify the other components or systems in Column B that should have also isolated. [2.5]

COLUMN A [ISOLATION]	COLUMN B [COMPONENT]
a. RWCU just isolated on low RPV level	1. Offgas System
b. MSL drains isolates on high MSL tunnel temperature	2. HPCI Steam supply
c. D/W floor drains isolates on high D/W pressure	3. RHR S/D Cooling
d. Main turbine trips on RPV high level	4. MSIV's
	5. No other isolations from this list

ANSWER 5.39 (2.50)

a. 3 [0.50 each]
b. 4 , 2 (after 30 min T.D.)
c. 3
d. ~~X~~ 5

REFERENCE

1. LOT 3-211 SCRO Obj. 4
2. none
3. K/A 223002 K1.03/3.2
   223002K103 ..(KA's)

QUESTION 5.40 (2.00)

When the mode switch is in RUN, the reactor can not be operated intentionally in a natural circulation mode, nor can an idle recirculation pump be started with the reactor in a natural circulation mode. STATE the BASES for these Two [2] restrictions. (One bases for each restriction) [2.0]

ANSWER 5.40 (2.00)

a. (TS 3.6.H.3) restricts operation under natural circulation to avoid potential thermal hydraulic/ neutronic instabilities [1.0]

b. (TS 3.6.J.) Not allowing recirc pump startup from natural circulation prevents reactivity insertion transients that would occur. [1.0]

REFERENCE

1. LOT 3-007 SCRO Obj. 4
2. none
3. K/A 202001 K1.02/4.1
   202001K102 ..(KA's)

(***** END OF CATEGORY 5 *****)

QUESTION 6.01 (1.00)

Backup Scram Valves provide a redundant means of venting air from the scram pilot valves and scram discharge valves. These backup valves are... [CHOOSE ONE] [1.0]

a. ...normally energized and will de-energize upon a RPS scram signal.

b. ...aligned such that two valves in series, one from each RPS trip channel, must actuate to vent the scram air header.

c. ...designed such that both RPS channels must trip in order for any one of the valves to actuate.

d. ...powered from the RPS Buses A and B.

ANSWER 6.01 (1.00)

c. [1.00]

REFERENCE

1. LOT 3-108 SCRO Obj. 1 and 6
2. none
3. K/A 212000 K3.05/3.8
   212000K305 ..(KA's)

QUESTION 6.02 (3.00)

You have directed the Reactor Operator to manually scram the reactor. STATE SIX [6] indications that the Reactor Operator has available to verify that the scram functioned properly. [3.0]

ANSWER 6.02 (3.00)

[0.5 each]

a. RPS Panels 9-15 and 9-17 each set of scram solenoid groups has white power lights. [4 white lights]

b. Each Control Rod has white scram light to indicate scram valves have repositioned.

c. Annunciator for cause of scram.

d. Annunciator for scram channel A or B.

e. Annunciator for Manual Scram.

f. Scram Discharge Volume Vent and Drain Valves (V3-32's & 33's) closed.

g. APRM Power decrease.

REFERENCE

1. LOT 3-108 SCRO Obj. 1 & 2
2. none
3. K/A 212000 K1.02/3.9
   212000K102 ..(KA's)

Also accept...

a. Scram Group indication Lights CRP 9-5.
   (Control Room Design PDCR # 86-07)
b. Rod drift alarms CRP 9-5.
c. Rod overtravel Green full in back lighting CRP 9-5.
d. One rod permissive white light CRP 9-5 with 5A-S1 (Reactor Mode SW) in refuel and all rods into or beyond 00.
e. Increasing/high scram discharge volume level as indicated by CRP 9-5 Instrument Volume Level indication or high level at 3, 12 and 21 gals annunciators.
f. Decreasing steam flow.
g. Low Scram air header pressure indicator CRP 9-5.
h. Low Scram air header annunciator CRP 9-5.

QUESTION 6.03 (1.00)

Which ONE [1] of the following plant conditions will NOT cause a GROUP 3 PCIS ISOLATION. [1.0]

a. Drywell pressure measures 2.7 psig.

b. Radiation level on the Refuel Floor is 115 mR/hr.

c. Reactor Building exhaust is 20 mR/hr.

d. Main Steam Line tunnel temperature is 212 degrees F.

ANSWER 6.03 (1.00)

d. [1.00]

REFERENCE

1. LOT 3-211 SCRO Obj. 4
2. none
3. K/A 223002 K1 03/ 3.2
   223002K103 ..(KA's)

QUESTION 6.04 (2.00)

The reactor is at 100% power. RHR Service Water Pump A is undergoing bearing replacement. Diesel Generator B has just been declared inoperable due to a leaky fuel line. Based upon the above conditions, state all LCO's that are applicable and state the actions required by technical specifications. Reference the technical specifications you use to develop your answer.

[2.0]

ANSWER 6.04 (2.00)

a. 3.5.C.2 can operate for 30 days with RHR SW pump A out of service [0.50]

b. 3.10.B.1 for one diesel generator inoperable must satisfy 3.5.H.1 [0.50]

c. 3.5.H.1 with one diesel generator inoperable and all core and containment cooling subsystems powered from the other diesel generator not operable, a shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hrs. [1.00]

REFERENCE

1. none
2. VY TS 3.5.c.2/3.10.b.1/3.5.h.1
3. K/A 226001 G005/4.0, 264000 G005/4.1
   264000G005 226001G005 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.05 (3.00)

Concerning the reactor vessel assembly: MATCH the following ITEMS in Column A with the ITEMS in Column B. Items in Column B may be used once, more than once, or not at all. [3.0]

COLUMN A Component

a. Jet pump assembly

b. Top of active fuel

c. Core plate

d. "pipe within a pipe"

e. Core shroud

~~f. Control Rod guide tubes~~

COLUMN B Function

1. Separates upward core flow from downward annulus flow

2. + 12 inches

3. ESF

4. Provides vertical and lateral support for the 12 peripheral fuel bundles

5. Instrument reference zero

6. Transfer weight of central fuel bundles to the bottom head

7. 2/3's core coverage

8. Provides means to inject boron

9. Provides forced circulation thru core

ANSWER 6.05 (3.00)

a. 9 and 7
b. 5
c. 4
d. 8
e. 1
~~f. 6~~ [0.50 each]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

1. LOT 3-001 SCRO Obj. 1
2. none
3. K/A 290002 K1.02/3.2 , K1.12/3.5, K4.02/3.2
   290002K112 290002K402 29000K102, ..(KA's)

QUESTION 6.06 (1.00)

Assuming no operator action, which of the following statements regarding reactor water level and the FEEDWATER LEVEL CONTROL SYSTEM is accurate. [1.0]

a. At Vermont Yankee a one inch change in reactor water level causes drive flow to increase which increases reactor power by about 3 Mwe.

b. An inadvertent HPCI injection will cause a steady state level increase ~~of about 15 inches~~ and trip the turbine.

c. One level control transmitter failing upscale will cause level to increase and ~~trip the turbine~~ trip the turbine

d. A relief valve lifting will cause coolant swell and a steady state level ~~of about 7 inches higher than the original level.~~ increase and trip the turbine.

ANSWER 6.06 (1.00)

b. [1.00]

REFERENCE

1. LOT 5-110 SCRO Obj. 3 & 5
2. none
3. K/A 259002 K1.08/3.7 , K1.02/3.8 , K3.01/3.9
   259002K102 259002K301 259002K108 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.07 (1.00)

The reactor is operating at 100% power. RCIC has been operating in the full flow test mode for 2 hours. Which of the following describes the suppression pool temperature rise assuming RHR Suppression Pool Cooling is not operated. [1.0]

a. 2 degrees F

b. 6 degrees F

c. 10 degrees F

d. 12 degrees F

ANSWER 6.07 (1.00)

b. (3 degrees per hr)

REFERENCE

1. LOT 3-302 SCRO Obj. 14
2. none
3. K/A 217000 A1.08/3.6
217000A108 ..(KA's)

QUESTION 6.08 (1.00)

Refuel operations are in progress. In accordance with technical specifications, which of the following RPS TRIPS need NOT be operable. [Choose One] [1.0]

a. scram discharge volume high water level

b. manual scram

c. IRM high flux

d. reactor low water level

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.08 (1.00)

d. [1.0]

REFERENCE

1. LOT 3-108 SCRO Obj. 3
2. none
3. K/A 212000 G005/4.50
   212000G005 ..(KA's)

QUESTION 6.09 (1.00)

The LPRM detector system utilizes ... [CHOOSE ONE]

a. ~~self powered~~ fission chambers.

b. detectors that operate in the proportional region to differentiate between neutrons and gammas.

c. eighty four [84] detectors spaced evenly throughout the core.

d. detectors that are gamma compensated to discriminate between gammas and neutrons. [1.0]

ANSWER 6.09 (1.00)

a. [1.00]

REFERENCE

1. LOT 3-104 SCRO Obj. 2 & 3
2. none
3. K/A 215005 5.01/2.9
   215005K501 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.10 (1.00)

Increasing reactor power from 60% to 70% using only control rods will: [CHOOSE ONE} [1.0]

a. ~~decrease~~ decrease flow in the higher powered channels only

b. ~~increase~~ increase flow in the lower powered channels only

c. ~~increase~~ increase flow in the higher powered channels only

d. not change flow in the channels significantly.

ANSWER 6.10 (1.00)

d. [With the core orificed most of the bundle head loss occurs across the orifice.] [1.00]

REFERENCE

1. LOT 2-311 SCRO Obj. 5
2. none
3. K/A 290002 K4.03/3.3
   290002K403 ..(KA's)

QUESTION 6.11 (1.00)

If the drywell temperature is 212 degrees F, which of the following statements describes reactor water level instruments. [1.0]

a. The Narrow Range Instrument, LT-6-52A, being a more sensitive level indicator, will provide an accurate level measurement.

b. The Narrow Range Instrument, LT-6-52B will read lower than actual level due to density effects.

c. The Shutdown Level Instrument, LT-2-3-61 provides an accurate level indication.

d. The Rosemont Level Instrument, LT-2-3-57A will read higher than the actual level.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.11 (1.00)

d. [1.00]

REFERENCE

1. LOT 3-002 SCRO Obj. 5 & 6
2. none
3. K/A 216000 K5.07/3.8
   216000K507 ..(KA's)

QUESTION 6.12 (1.00)

The Reactor Operator is increasing power from 90% to 100% using control rods. Channel A of the ROD BLOCK MONITOR [RBM] has been bypassed and is not available. Channel B becomes inoperable. Which one of the following actions in accordance with OP 2133," Rod Block Monitor Channels", would you direct the operator to follow? [1.0]

a. Place the inoperable RBM channel in the tripped condition, ~~within one hour~~.

b. Reduce power with recirulation flow and continue rod withdrawal.

c. Verify the reactor is not operating on a limiting control rod pattern.

d. Restore the inoperable RBM channel to operable status within 48 hours.

ANSWER 6.12 (1.00)

a. [1.00]

REFERENCE

1. LOT 3-107 SCRO Obj. 4
2. OP 2133
3. K/A 215002 K3.01/3.5
   215002K301 ..(KA's)

QUESTION 6.13 (1.00)

The Technical Specifications state that the reactor coolant system pressure shall not exceed 1335 psig with irradiated fuel in the vessel and the reactor in the RUN mode. This limit is based upon...[CHOOSE ONE]. [1.0]

a. coolant and steam piping design.

b. reactor pressure vessel design only.

c. coolant and steam line and reactor pressure vessel design.

d. coolant system piping and reactor pressure vessel design.

ANSWER 6.13 (1.00)

d. (1335{steam space}---1375{bottom of vessel}. The 1375 is derived from design pressures of RPV and coolant system piping. TS BASES 1.12) [1.00]

REFERENCE

1. LOT3-007 SCRO Obj. 4
2. none
3. K/A 202001 G005/4.2
   202001G005 ..(KA's)

QUESTION 6.14 (1.00)

Which of the following is a symptom that the number one orifice of a recirculation pump seal is plugged? [1.0]

a. Number 1 seal pressure decreases

b. Number 1 seal pressure increases

c. Number 2 seal pressure decreases

d. Number 2 seal pressure increases

ANSWER 6.14 (1.00)

c. [1.0]

REFERENCE

1. LOT 9-002 SCRO Obj. 2
2. none
3. K/A 202001 A2.10/3.9
   202001A210 ..(KA's)

QUESTION 6.15 (1.00)

Which of the following would prevent the start permissives to be satisfied in the manual start circuit for a feedwater pump [CHOOSE ONE]? [1.0]

a. only one condensate pump running

b. feedwater pump discharge valve open

c. feedwater pump lube oil pressure 7 psig

d. feedwater pump suction pressure 155 psig

ANSWER 6.15 (1.00)

c. or d. [1.00]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

1. LOT 5-109 SCRO Obj. 3
2. none
3. K/A 259001 A4.02/3.7
   259001A402 ..(KA's)

QUESTION 6.16 (1.00)

RCIC is controlling level/pressure one hour after a reactor scram and MSIV isolation. The RCIC Flow Controller is in MANUAL. The full flow test valve is throttled open to balance the needs of pressure and level control. Assuming no operator action, which of the following describes the system behavior as the reactor cools down? [1.0]

a. RCIC will isolate at 70 psig reactor pressure

b. the RCIC turbine will stall

c. the RCIC turbine will trip on high reactor water level

d. RCIC will maintain RPV water level fairly constant

ANSWER 6.16 (1.00)

c. [1.00]

REFERENCE

1. LOT 3-302 SCRO Obj. 1 & 3
2. none
3. K/A 217000 A1.03/4.0
   217000A103 ..(KA's)

QUESTION 6.17 (1.00)

Which of the following statements describes the power supply to the RCIC system? [CHOOSE ONE] [1.0]

a. the RCIC system is independent of auxiliary AC power

b. RCIC is dependent on AC power and the diesel generators

c. RCIC operation requires only DC power from the station battery

d. RCIC operation requires only auxiliary AC power

ANSWER 6.17 (1.00)

a. or c. [1.00]

REFERENCE

1. LOT 3-302 SCRO Obj. 1
2. none
3. K/A 217000 K6.01/3.5, K2.01/2.8
   217000K201 217000K601 ..(KA's)

QUESTION 6.18 (2.50)

The reactor is in an early stage of startup with control rods being withdrawn. The Rod Worth Minimizer becomes inoperable and must be bypassed. What procedural and technical specification requirements must be satisfied in order to bypass the RWM? [LIST 5 REQUIREMENTS] [2.5]

ANSWER 6.18 (2.50)

a. Management approval (Plant Manager or Operations Superintent or Operations Supervisor)

b. More than 12 rods withdrawn

c. Second operator stationed

d. Templates installed

e. Notify the R/CE Supervisor [0.50 each]

REFERENCE

1. LOT 3-109 SCRO OBj. 6
2. none
3. K/A 201006 G001/3.8, G006/3.6
201006G006 201006G001 ..(KA's)

QUESTION 6.19 (3.00)

While operating at 100% rated power, a main steam relief valve [SRV] inadvertently opens. In accordance with OT 3121,"Inadvertant Opening of a Relief Valve", the operator should immediately confirm that an SRV is open. LIST six [6] indicators available to confirm an SRV is open. [3.0]

ANSWER 6.19 (3.00)

a. Generator load reduction of 12-15%

b. Increasing torus temperature

c. "Sfty/Blodn Vlv Leak" alarm

d. "Rx Relief Valve Open" alarm

e. Steam flow/feed flow mismatch

f. SRV indicator lights CRP9-3

g. Pressure/Level transient

h. SRV tailpipe temperature increase

i. "BlowDwn Vav BELLO Leak"

~~j. Acoustic Monitor indicator~~

REFERENCE

1. LOT 9-006 SCRO Obj. 2
2. OT 3121
3. K/A 239002 G011/4.2, A1.07/3.0, A1.08/4.1, A1.09/3.3
   239002A109 239002A108 239002A107 239002G011 ..(KA's)

QUESTION 6.20 (1.00)

A 24 year old contractor has a job in an area with a radiation field of 175 mR/hr. He has received 600 mRem at another facility this quarter. His lifetime exposure is 29.10 Rems. In accordance with AP 501,"Radiation Protection Standards", which ONE of the following describes the allowable work time for this individual?

[1.00]

a. 26 minutes

b. 59 minutes

c. 86 minutes

d. 116 minutes

ANSWER 6.20 (1.00)

c. 86 minutes [1.00]

REFERENCE

1. LOT 06-305 SCRO Obj. 1
2. AP 501
3. K/A 294001 K1.03/3.8
   294001K103 ..(KA's)

QUESTION 6.21 (1.00)

A Chemistry and Health Physics Assistant phones you as the Shift Supervisor for approval of an RWP as required by AP 502,"Radiation Work Permits". He indicates that the total dose estimate for the job is one man-rem and he has established appropriate radiological controls. Which of the following describes the action you should take? [1.0]

a. Disapprove the RWP and log the request

b. Approve the RWP and log the request

c. Approve the RWP and notify the ALARA Engineer

d. Request an ALARA analysis

ANSWER 6.21 (1.00)

d. [AP 502, page 8 states that if the estimated total dose is greater than or equal to 1 man rem the ALARA Engineer must be contacted and an ALARA analysis must be done] [1.00]

REFERENCE

1. LOT 6-305 SCRO Obj 2, 4
2. AP 502
3. K/A 294001 K1.03/3.8 K1.04/3.6
   294001K103 294001K104 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.22 (3.00)

LIST SIX (6) radiological conditions which require the use of a Radiation Work Permit (RWP) as given in AP 502,"Radiation Work Permit." [3.00]

ANSWER 6.22 (3.00)

[any 6 @ 0.5 each]
1. Entry into High Radiation Area
2. Entry into Airborne Radiation Area
3. Any work area where contamination exists in excess of 10,000 dpm/100 cm2 beta-gamma or 1000 dpm/100 cm2 alpha.
4. Entry into primary containment
5. Entry into an area to handle or inspect new fuel elements
6. Opening process line from which radioactive liquids or gases may be expected to escape to the work area
7. Handling and storage of radioactive materials outside the RCA
8. Any work in the spent fuel pool
9. Entry into the TIP room

REFERENCE

1. LOT 6-305 SCRO Obj 2, 4.
2. AP 502
3. K/A 294001 K1.03/3.8 K1.04/3.6
294001K103 294001K104 ..(KA's)

QUESTION 6.23 (1.50)

List the THREE [3] different methods of determining valve position when performing valve lineups in accordance with AP 155," Current System Valve and Breaker Lineup and Identification". [1.50]

ANSWER 6.23 (1.50)

a. Check the position of manual valves by operating it in the shut direction. [0.50]

b. Use indication lights on control panel for MOV's and automatic valve position. [0.50]

c. Visual observation of valve position. [0.50]

REFERENCE

1. LOT 6-301 SCRO Obj. 32
2. AP 155
3. K/A 294001 K1.01/3.7
   294001K101 ..(KA's)

QUESTION 6.24 (1.00)

An operator notices while performing his rounds, that a valve position is not in accordance with the required lineup status. Which of the actions listed is required by AP 155,"Current System Valves and Breakers Lineup and Identification". [1.0]

a. With concurrence of the Shift Supervisor, the operator changes the valve position to the required status.

b. With concurrence of the Control Room Operator, the operator changes the valve position to the required status.

c. The operator changes the valve position to the required status and informs the Shift Supervisor.

d. The operator changes the valve position to the required status and informs the Control Room Operator.

ANSWER 6.24 (1.00)

a. [1.00]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

1. LOT 6-301 SCRO obj. 32
2. AP 155
3. K/A 294001 K1.01/3.7
   294001K101 ..(KA's)

QUESTION 6.25 (1.00)

Which of the following statements describes procedural requirements of AP 140, "Vermont Yankee Local Control Switching Rules" for temporarily removing a WHITE TAG? [1.0]

a. The Authorized Person uses ~~VYFO~~ VYAPF0140.02 140.02, "VY SWITCHING AND TAGGING REQUEST", to document his request for temporary removal.

b. The Authorized Person removes the tag and informs the Shift Supervisor and the Control Authority.

c. The Authorized Person ensures that no personnel or equipment safety concerns are likely to result.

d. The Authorized Person directs the Switchman to remove the tag.

ANSWER 6.25 (1.00)

c. [1.00]

REFERENCE

1. LOT 6-301 SCRO Obj. 12
2. AP 140
3. K/A 294001 K1.01/3.7
   294001K102 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.26 (1.00)

Per procedure AP 140,"Vermont Yankee Local Control Switching Rules", you are the Control Authority determining the need for independent verification upon returning a tagged component back to service. Which of the following conditions could exempt the component from independent verification. Assume the component cannot be functionally tested and it would take an operator 5 minutes to perform the verification. [1.0]

a. The component is in an oxygen deficient atmosphere.

b. The component is in an area where general area radiation fields are 450 mR/hr.

c. The component is in an area where temperatures are greater than 125 degrees F.

d. The Control Authority may at any time waive the independent verification if he feels it prudent to do so.

ANSWER 6.26 (1.00)

b. [1.0]

REFERENCE

1. LOT 6-301 SCRO Obj. 12
2. AP 140
3. K/A 294001 K1.02/4.5
   294001K102 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.27 (3.00)

MATCH the EVENT listed in Column A with the EMERGENCY CLASSIFICATION listed in Column B. Procedure AP 3125,"EMERGENCY PLAN CLASSIFICATION AND ACTION LEVEL SCHEME" is a handout. [3.0]

Column A [Event]

a. A ground occurs on 125 VDC station battery buses A and B. Both buses cannot be reenergized.

b. During a refueling outage, while working on the roof of the reactor building, the wind is measured at 105 mph.

c. While performing maintenance, a flamable gas used for welding is released and fills the Control Room.

d. Terrorist take over the Control Room.

e. With the reactor at 100%, an I&C error causes HPCI to initiate and inject into the RPV.

f. The plant is shutdown for a main condenser retubing and an operator calls to report an accident which has opened a large hole in the torus and is draining the torus.

Column B [Emergency Classification]

1. UNUSUAL EVENT
2. ALERT
3. SITE AREA EMERGENCY
4. GENERAL EMERGENCY
5. NONE

ANSWER 6.27 (3.00)

a. 3
b. 2
c. 3
d. 4
e. 5
f. 3

[0.50 each]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

1. LOT 6-307 SCRO Obj. 2
2. none
3. K/A 294001 A1.16/4.7
   294001A116 ..(KA's)

(***** END OF CATEGORY 6 *****)
(********** END OF EXAMINATION **********)