



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

ENCLOSURE 1

EXAMINATION REPORT - 50-302/92-301

Facility License: Florida Power Corporation

Facility Name: Crystal River Nuclear Plant

Facility Docket No.: 50-302

Examinations were administered at the Crystal River Nuclear Plant near Crystal River, Florida.

Chief Examiner:

Richard S. Baldwin
Richard S. Baldwin

12/17/92
Date Signed

Approved By:

Michael E. Ernestes
Michael E. Ernestes, Chief
Operator Licensing 2
Division of Reactor Safety

12/17/92
Date Signed

SUMMARY

Scope: Requalification written examinations and operating tests were administered to nine Reactor Operators (RO) and six Senior Reactor Operators (SRO) during the week of November 16, 1992. These operators were combined to form three crews for simulator examinations. Additionally, a requalification written examination retake was administered to an RO who had failed the 1991 examination.

Results: Eight ROs and four SROs passed these examinations. All others failed. One crew failed the examination. The RO retake passed this examination. Based upon the above results, the Crystal River licensed operator requalification program has been determined to remain rated satisfactory.

Generic weaknesses identified were:

1. Use of Emergency and Dose rate calculation procedures, paragraphs 4.c.
2. SROs failure to identify the PORV closed, paragraph 4.d.

3. SROs keeping crews informed of which procedure was in effect, paragraph 4.d.
4. Use of place-keeping aids while using Abnormal and Emergency Procedures, paragraph 4.d.

REPORT DETAILS

1. Persons Contacted

- *G. Boldt, Vice President, Nuclear Production
- *B. Conklin, Director, Materials
- *B. Hickie, Director, Nuclear Plant Operations
- *L. Kelley, Director, Nuclear Operations Training
- *J. Lind, Manager, License Operator Training
- *T. Miller, Operations Evaluator
- *D. Porter, Manager, Nuclear Operations
- *J. Smith, Training Supervisor
- *J. Springer, Training Supervisor

Other licensee employees contacted included engineers, instructors, operators, and office personnel.

2. Examiners

- *R. Baldwin, Chief Examiner, Region II
- *J. Nickolaus, PNL Examiner
- *D. Faris, PNL Examiner

3. Other NRC Personnel Attending Exit

- *A. Gibson, Director, Division of Reactor Safety
- *R. Freudenberger, Resident Inspector, Crystal River

*Attended exit interview

4. Discussion

a. Examination Results

Licensed operator requalification examinations were administered at the Crystal River Nuclear Plant in accordance with NUREG-1021, Operator Licensing Examiner Standards, Revision 7. Written examinations and operating tests were administered to nine Reactor Operators and six Senior Reactor Operators. One additional Reactor Operator was administered and passed a requalification retake written examination. One Reactor Operator failed the written examination. One Senior Reactor Operator failed the simulator examination, and one Senior Reactor Operator failed the Job Performance Measures (JPMs) portion of the operating examination. These 15 operators were combined to form 3 operating crews for the simulator portion of the operating test. One crew failed the simulator portion of the operating examination.

b. Licensed Operator Requalification Program Evaluation

Based on the examination results, the examination team found the Crystal River Requalification Program met the criteria established in NUREG-1021, Operator Licensing Examiner Standards, ES 601 D.2 (Revision 7), and thus was determined to be satisfactory. The facility is permitted to administer the re-examinations for returning those individuals that failed this examination to licensed duties. However, these individuals must still pass a subsequent NRC administered examination for license renewal.

c. Written Examination Preparation and Administration

The examiners reviewed the reference material supplied by the licensee and determined it to be adequate to support the examination.

The licensee supplied a sampling plan describing the requalification cycle topics and the selection process used for the topics to be included in the examination. This sampling plan was determined to be adequate for developing comprehensive examinations used during the requalification cycle.

The examination team changed or substituted approximately 20 percent of the questions. Based on written examination review, there were three types of changes required. These included:

- (1) Total replacement of the question (accounted for approximately 13 percent of the changes to the SRO examination and 16 percent of the changes to the RO examination, due to being direct look-ups in the reference material).
- (2) Changed distractors to be more plausible.
- (3) Changed the stem of the questions to remove unnecessary information.

All of the questions in the question bank were time validated. The entire examination was not time validated as a complete exam. The time validation was accomplished by adding the individual test item validation times to determine the length of the examination. This method while in principle would appear to be valid, however, in reality it was not. For example, one Part A examination administered took operators 26 to 38 minutes to complete. These times included time for review. The Part A examination is designed to have a time validation of 45 minutes with a 15 minute

review period. The Part B time validations exhibited similar results. The range of times for this part of the written examination was between one hour and five minutes to two hours. The Part B examination is designed to take one hour and thirty minutes with a thirty-minute review period. Time validation of future examinations needs to maintain Examiner Standard requirements.

There were two written examination questions on the SRO examination and one question on the RO that indicated generic weaknesses in operator knowledge. These are:

- (1) One of the questions of concern appeared on both examinations. This question required the use of EP-220, "Pressurized Thermal Shock", Enclosure 1. The question dealt with a steam generator tube rupture in conjunction with low Tave. Seven of the sixteen operators that took the written examination were unable to determine the required actions.
- (2) The other question concerned the use of EM-204A, "Off-site Dose Assessment During Radiological Releases". Four of the six SROs and three of the ten ROs answered the question incorrectly. This question dealt with the determination of dose rate at the site boundary based upon the initial conditions of a large break LOCA coincident with core degradation. The use of EM-204A was identified as a weakness during the initial examinations given in May of 1992 as described in the June 23, 1992, examination report.

Three questions were changed to allow accepting two answers as correct. One question was deleted due to not having a correct answer. The plant curves used to determine the correct answer were revised and tank levels changed making both emergency diesel generators inoperable. This change caused the question to have no correct answer, thus requiring question deletion.

d. Operating Test Preparation and Administration

The JPMS and simulator scenarios were reviewed onsite by the examination team during the week of October 26, 1992. The NRC reviewed simulator scenarios prior to preparation week in order to facilitate changes in an expeditious manner. The following types of changes were made:

- (1) The exam team deleted a number of proposed critical tasks that were not critical based on Examiner Standards criteria.
- (2) The exam team made enhancements to ensure critical tasks met the Examiner Standards, these required significant changes during the preparation week.

Two scenarios were used during the examination week. The proposed scenarios were good in their ability to assess operator performance using facility abnormal, emergency and normal operating procedures. The scenarios were designed to average approximately 50 minutes of contact time. The actual contact time was significantly greater. All the simulator times were greater than 50 minutes, averaging approximately 60 - 65 minutes. One simulator crew was required to run approximately one hour and fifty minutes to afford the operators the opportunity to complete all required critical tasks.

The proposed JPMs covered high level tasks being performed inside and outside the control room. One of the five JPMs administered to each operator was an "alternate path" JPM. Four of six SROs failed the "alternate path" JPM. This was considered to be a generic weakness among SROs. These weaknesses represent a number of different areas. These are:

- (1) SROs could not verify that the PORV was closed and allowed low pressure emergency core cooling systems to inject into the core.
- (2) There was a misunderstanding by SROs of how acoustic monitors work and how they are reset.
- (3) The inability of the SROs to use the plant computer in order to plot and trend PORV tail pipe temperatures.

Another generic weakness identified among SROs was in the use of EM-202, "Duties of the Emergency Coordinator", Enclosure 3, Event Notification Worksheet. Three of the six SROs did not completely fill in the worksheet in accordance with the JPM requirements. As a result, the exam team determined that the critical steps originally marked were not all critical. Performance criteria changes had to be made during exam administration.

Two JPMs had to be re-reviewed because the determination of a critical step(s) was not clear. The JPM performance criteria was modified and more clearly delineated for these JPMs. For example, if one valve used as an isolation valve was closed, then the in-series control valve being closed in the JPM was not critical and visa versa.

The facility is reminded that critical steps should be chosen such that the task cannot be completed if the step is not accomplished. The criteria threshold should be to such a degree that if an operator were to fail the operating examination when more than one JPM is failed, there would be no dispute if this criteria was used for the basis for an unsatisfactory requalification program based upon JPM failures. A thorough analysis of the facilities' JPMS is warranted to ensure all JPMS adhere to this criteria.

An operating crew for the simulator examination was composed of three ROs, two SROs, and an Shift Operating Technical Advisor (SOTA). The SOTA that normally works with the crew was used, but was not directly evaluated. Each crew was evaluated using two scenarios. Generic weaknesses identified during the simulator examinations are noted below:

- (1) The SROs, as procedure readers, did not inform the crew what procedures they were using. They did not read cautions or notes to the crew while in these procedures.
- (2) The use of place-keeping aids by the SROs was basically nonexistent while using Abnormal and Emergency Operating Procedures. The method of choice of most operators was to use their fingers as place-keeping aids. This was described in the initial examination report dated June 23, 1992. This problem arises from the vast number of procedures an operator must use to combat an event. It is recommended that the facility analyze the number of procedures in use and determine if too many are in use at one time.
- (3) One crew used the SOTA solely for cooldown rate determination rather than one of the crew members being assigned. The SOTA acted as an intricate part of the crew, not an independent backup of the crew's decisions. Cooldown rates of 500°F/minute were being reported based on one-minute intervals. The ANSS used this particular cooldown rate and did not combat the event aggressively due to misleading information provided by the SOTA.
- (4) The crews did not announce starting of major equipment to the plant during normal or emergency operations.

During the simulator examinations other significant operating errors by the crew were observed, however, not generic to the plant. These were as follows:

- (1) The improper use of HPI/PORV cooling. One crew used only one MUP instead of two as required by procedure.

- (2) Overcooling of the RCS due to inattentive use of the turbine bypass valves (TBVs). The crew did not observe the self inflicted overcooling event with the TBVs open until pointed out by the SOTA.
- (3) The crew's isolation of a OTSG during a steam generator tube rupture event at a temperature significantly below the 540°F allowed by the procedure.

Administration of the examinations went smoothly and according to the facility prepared schedule. However, the run times of the simulator examinations lengthened the two simulator days beyond the expected scheduling approximations. The facility scheduling, for the most part, and close attention to examination security, was effective.

e. Evaluation of Facility Evaluators

The NRC examiners monitored the facility evaluators for their ability to function as objective and impartial evaluators. The Crystal River evaluators were knowledgeable of the requirements depicting satisfactory operator knowledge/performance evaluation and of plant system operations. Post-scenario questioning by the facility evaluators was not accomplished until prompted by the NRC examiners. Follow-up questioning on one occasion lead to more of a training session than an investigative procedure for determining what and why the operators had performed in a particular manner. The NRC pointed this out to the facility examiners and this practice was stopped. Post-scenario discussions with the facility evaluators concerning simulator scenario operator performance indicated that the evaluators were thorough and unbiased.

Evaluators administering JPMs were effective, however, not all evaluators performed JPMs consistently. Some evaluators read the initial conditions to the operators while others handed the operator the initial condition sheet and let them read it to themselves. JPM examinations should be administered identically to each operator in order to prevent misunderstandings and errors in the administration of the JPM.

5. Procedural Problems

The administration of the operating test identified the following procedural problems that require additional guidance from the Operations department to ensure all operators perform procedures similarly when guidance is not explicitly contained in the procedure:

- (1) AP-380, "Engineered Safeguards Actuation", Step 3.21, allows starting of an RCP in each loop provided adequate Subcooling Margin (SCM) exists (50°F). All three crews performed this step differently. One crew required at least 60-70°F SCM before an RCP could be started. Another crew required a different range before they would start an RCP.
- (2) AP-450, "Emergency Feedwater Actuation", Step 3.9, implies that an RCP is required before a "DRY" OTSG can be fed when it may not be necessary.
- (3) AP-450, "Emergency Feedwater Actuation", Step 3.9, allows a "DRY" steam generator be fed at less than or equal to 500 gpm. Under similar conditions not all crews fed the OTSG at the same rate. The feed rates varied from approximately 20 gpm to as high as 220 gpm.
- (4) Entry conditions into EP-290, "Inadequate Core Cooling," are not well understood by all operators. Some crews entered ICC with minus 2 to minus 3 degrees of subcooling. While other crews knew that EP-290 should not be entered until at least minus 20 degrees of subcooling is identified.

6. Material Condition of the Plant

The examiners noted one problem concerning auxiliary battery room breakers labeled incorrectly.

7. Exit Meeting

At the conclusion of the site visit, the examiners met with representatives of the plant staff, listed in Enclosure 1, to discuss the results of the examinations. The licensee did not identify as proprietary any material provided to or reviewed by the examiners. There were no dissenting comments from the licensee.

ENCLOSURE 2

SIMULATOR FIDELITY REPORT

Facility Licensee: Florida Power Corporation

Facility Docket No.: 50-302

Operating Tests Administered On: November 16 - 20, 1992

This form is used only to report observations. These observations do not constitute, in and of themselves, audit or inspection findings and are not, without further verification and review, indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required solely in response to these observations.

During the conduct of the simulator portion of the operating test, the following items were observed:

<u>ITEM</u>	<u>DESCRIPTION</u>
EFW valves	During the performance of a JPM concerning Emergency Feedwater, emergency feedwater valves would not be in the same position each time that particular JPM was initialized. This did not hinder the performance of the JPM.

ATTACHMENT 3

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ANSWER KEY COVER SHEET

TRAINING PROGRAM TITLE: LICENSED OPERATOR REQUALIFICATION

EXAMINATION TITLE: LICENSED OPERATOR REQUALIFICATION - CATEGORY A

EXAMINATION NAME OR NUMBER: 1992 CATEGORY A SRO EXAM

PREPARER:

Richard A. L.

DATE:

11/10/92

APPROVAL:

Johnnie Smith
Nuclear Training Supervisor

DATE:

11-10-92

INSTRUCTIONS FOR TAKING THE EXAMINATION

1. Use black ink or dark pencil only to ensure legible copies.
2. Ensure your name is printed in the blank provided on the cover sheet of the examination and the answer sheet.
3. Each question has only **ONE** correct answer. Mark your answers on the answer sheet provided and do not leave any question blank. If additional paper is required, use only the lined paper provided by the examiner.
4. All questions are worth 1.0 point.
5. If parts of the examination are not clear with respect to their intent, ask questions of the examiner only.
6. The examination is designed to take approximately 45 minutes to complete. You will be given **1 HOUR** to complete the examination.
7. The questions have been time validated by knowledgeable persons. You should be aware that not every answer needs to be verified by consulting a reference and excessive usage of reference material may cause you to not complete the examination in the allotted time.
8. Restroom trips are limited and only one examinee at a time may leave. You must avoid all contact with anyone outside the examination room to avoid even the appearance or possibility of examination compromise.
9. Cheating on the examination could result in revocation of your license and may result in more severe penalties.
10. You must sign the statement on the cover sheet that indicates the work on the examination is your own and that you have not received or been given any assistance in completing the examination. This must be signed **AFTER** the examination has been completed.
11. When you are finished and have turned in your completed examination, leave the examination area.

I. SCENARIO OVERVIEW

The unit was operating at 100% power, MOL. I&C was performing SP-110 in the "A" RPS channel. A large steam break occurred on the OTSG-1B outside the RB and upstream of the MSIVs. FWP-2B failed to trip from the EFIC FW Isolation. CAV-5 failed to close on the ES actuation. RWP-2B failed to start on the ES actuation.

INSTRUCTOR NOTE: Examines must not be present during setup.

II. INITIAL CONDITIONS:

Initialize the simulator to 100% power MOL.

III. CONTROL BOARD SETUP:

1. ___ Perform a lamp check using panel diagnostics.
2. ___ Un-freeze the simulator.
3. ___ Ensure SPDS screens are selected properly for current conditions. (Δ Flux on left screen and Normal on right screen)
4. ___ Ensure computer screens are selected for proper groups for current conditions. (Group 59 on the right screen and group 108 on the left screen)
5. ___ Freeze the simulator.
6. ___ Ensure all charts are inking.
7. ___ Advance and mark all charts.
8. ___ Advance line printer paper.
9. ___ Advance annunciator typer paper and remove used sheets.
10. ___ Un-freeze the simulator and allow to run for 5 min.
11. ___ Freeze the simulator.

IV. SCENARIO SETUP:

1. ___ **Fail** CAV-5 open (I/F page 742)
2. ___ **Fail** Open RWP-2B breaker (I/F page 654)
3. ___ **Prevent** the B MFWP from tripping (I/F page 638) Auto trip failure/T.
4. ___ **Arm**, Numbered Malfunction MS-002B ("B" MS line break), set to 0.3.
5. ___ Unfreeze the simulator.
6. ___ Place the "A" RPS channel into "Manual Bypass" and place the test module for RCS pressure in the "A" RPS channel into Test Operate position.
7. ___ Freeze the simulator and take a snap-shot.
8. ___ Unfreeze the simulator.
9. ___ Select PZR spray valve to manual and open valve fully.
10. ___ Activate the stack when the low RCS pressure alarm comes in.
11. ___ Perform the following procedural actions:
 - a) After HPI is actuated, select PZR spray valve to Auto.
12. ___ Allow the simulator to run until RCS pressure is 2200 psi as indicated on the lower portion I/F screen. Acknowledge annunciator alarms and freeze the simulator ensuring that all active annunciator alarms are on.

V. PRE-EXAM REVIEW:

1. ___ Verify validity of Exam answer key to the frozen simulator.
2. ___ Resolve any discrepancies.

VI. SHIFT TURNOVER

1. ___ Recall examinees into simulator room.
2. ___ Review rules of the exam.
3. ___ Handout Information Sheet to each examinee.
4. ___ Review Information Sheet with examinees.
5. ___ Allow examinees to perform a 5 min. walkdown of the MCB.
6. ___ Handout the examination.
7. ___ Announce exam start time. Time: _____
8. ___ Announce exam stop time. Time: _____

INFORMATION SHEET

INITIAL CONDITIONS:

Tr plant operating at 100% power, at 210 EFPD.
I&C performing SP-110 in "A" RPS channel.

TRANSIENT DESCRIPTION:

A large steamline/feedline break has occurred on the "B" Steam Generator. RM-A12 is out of service.

OPERATOR ACTIONS TAKEN:

None

ELAPSED TIME:

Approximately 5 min since the rapid de-pressurization of the B OTSG.

Test Item:	SSE-02/01	
Lesson Plan:	ROT-5-63	
Objective No.:	B3	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given symptom, immediate or follow-up action.	
Reference:	AP-380	
K/A:	000	Emergency Plant Evolutions
	009	Small Break LOCA
	EA1.18	Balancing HPI loop flows
Task:	0040501002	Control High Pressure Injection flow rate
Importance:	3.4/3.2	
Expected Time (min):	2.0	

Based on current plant conditions, which **ONE** of the following statements correctly describes the steps required to BALANCE HPI flows?

- a) Select "HPI RC-1", "HPI RC-2" and "HPI RC-3" hand switches to "BYPASS"; close MUV-27 and adjust HPI flows as necessary.
- b) Select "HPI RC-1", "HPI RC-2" and "HPI RC-3" hand switches to "RESET"; close MUV-27 and adjust HPI flows as necessary.
- c) "RESET" 1500# bistables in ES channels 1, 2 and 3, close MUV-27 and adjust HPI flows as necessary.
- d) Close MUV-27 and adjust HPI flows as necessary; no additional steps are required.

Answer: c

Test Item:	SSE-02/02	
Lesson Plan:	ROT-5-65	
Objective No.:	B2	
Objective:	State the Immediate Actions of this abnormal procedure.	
Reference:	AP-460	
K/A:	000	Emergency Plant Evolutions
	040	Steam Line Rupture
	EA1.02	Feedwater isolation
Task:	0190401002	Perform required actions for a malfunction of the EFIC system including spurious actuation and failure to actuate
Importance:	4.5/4.5	
Expected Time (min):	1.5	

Test item: #2 (SRO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following statements with respect to the "B" Main Feedwater Pump (FWP-2B) is correct?

- a) "B" MFWP (FWP-2B) should be tripped due to actuation of "B" train Main Feedwater Isolation.
- b) "B" MFWP (FWP-2B) should be tripped due to actuation of "B" train Main Steam Line Isolation.
- c) "B" MFWP (FWP-2B) should be tripped due to actuation of "B" train Emergency Feedwater.
- d) "B" MFWP (FWP-2B) should NOT be tripped.

Answer: a

Test Item:	SSE-02/04	
Test Item Ref:	ROT-5-63	
Objective No.:	B2	
Objective:	List from memory the immediate actions required by this Abnormal Procedure.	
Reference:	AP-380	
K/A:	000 Emergency Plant Evolutions 009 Small Break LOCA EK3.26 Maintenance of RCS subcooling	
Task:	0000501006	Perform the actions to ensure core cooling and subcooling margin are maintained during an emergency event.
Importance:	4.4/4.5	
Expected Time (min):	1.5	

Test Item: #3 (SRO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following is the required sub-cooling margin?

- a) 20°F
- b) 30°F
- c) 50°F
- d) In accordance with the SPDS curve

Answer: b

Test Item:	SSE-02/05
Lesson Plan:	ROT-5-01
Objective No.:	A1
Objective:	Given a copy of Technical Specifications and Technical Specification Interpretations clarify and/or interpret STS requirements.
Reference:	STS 3.4.5
K/A:	<div>035 Steam Generator System</div> <div>010 Startup/Shutdown</div> <div>System Generic #8 Ability to recognize indications for system operating parameters, which are entry conditions for Technical Specifications.</div>
Task:	3410103037 Apply STS direction for safety limits, safety system settings, and LCOs
Importance:	3.4/4.2
Expected Time (min):	2.25

Given the following plant conditions:

- The plant is in Mode 1.
- The Diesel Fuel Storage Tank readings are as follows:
EDG "A" - 6'7" EDG "B" - 6'10½"
- The "A" ES 4160 V bus is powered from the Unit 3 Aux Transformer (BKR 3207 closed with 3211 and 3205 open).

Which **ONE** of the following describes required action(s) for this situation?

- a) Restore two off site circuits to operable status within 72 hours or be in at least Hot Standby within the next 6 hours and Cold Shutdown within the following 30 hours.
- b) Declare "A" EDG inoperable and within 1 hour verify operability of the remaining AC sources and once per 8 hours thereafter. Within 24 hours verify that "B" EDG will start and accelerate to rated speed.
- c) Declare one off site circuit and one EDG inoperable and within 1 hour initiate action to place the unit in Hot Standby within the next 6 hours. Be in Hot Shutdown within the following 6 hours and in Cold Shutdown within the subsequent 24 hours.
- d) Verify the operability of two offsite A.C. circuits within one hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to operable status within 2 hours or be in at least hot standby within the following 30 hours. Restore at least two diesel generators to operable status within 72 hours from the time of the initial loss or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

Answer: b

Test Item:	092	
Lesson Plan:	ROT-5-01	
Objective No.:	B10	
Objective:	Given any plant condition and a copy of Technical Specifications, identify those conditions which are violations of a limiting condition for operation and discuss the required corrective actions.	
Reference:	STS 3.0.3	
K/A:	000	Emergency Plant Evolutions
	033	Loss of Intermediate-Range Instrumentation
	EA2.10	Tech-Spec limits if both intermediate-range channels have failed
Task:	1190301015	Apply Technical Specification requirements.
Importance:	3.1/3.8	
Expected Time (min):	2.5	

The following plant conditions exist:

- The plant is at 100% power.
- Intermediate range "B" (NI-4) is inoperable due to a failure of the detector.
- An electrical failure has caused the de-energization of VBDP-5.
- It is estimated that it will take 2 to 3 days to place VBDP-5 back in service.

Which **ONE** of the statements below gives the required action(s) for this situation?

- a) Reduce and maintain power \leq 5% full power.
- b) Must maintain power \geq 5% full power.
- c) Restore VBDP-5 within 8 hours or be in hot standby within the next 6 hours and in cold shutdown within the following 30 hours.
- d) Within one hour action must be initiated to place the unit in Hot Standby with the CRD breakers open within the next 6 hours.

Answer: d

Test Item:	377	
Lesson Plan:	ROT-1-47	
Objective No.:	B3	
Objective:	Explain how and why changes in the moderator affect core reactivity.	
Reference:	OP-103C	
K/A:	001	Control Rod Drive System
	000	Generic
	K5.26	Definition of moderator temperature coefficient : application to reactor control
Task:	10CFR55	
Importance:	3.3/3.6	
Expected Time (min):	2.0	

A reactor startup is in progress and the nuclear operator has just announced that the reactor is critical. At this point an adjustment is made to the feedwater flow to both OTSGs which inadvertently causes a slight overfeeding such that T_{ave} decreases from 332°F to 525°F . Assuming middle of life conditions. RCS boron concentration is 800 ppm, and no automatic or operator action occurs, which **ONE** of the following describes the response of the reactor to this event?

- a) Reactor power will increase to and stabilize at $\approx 5 \times 10^{-7}$ amps on the intermediate range.
- b) The reactor will be subcritical and power will decrease to the point of steady state subcritical multiplication.
- c) Reactor power will increase and stabilize at $\approx 9\%$ full power.
- d) Because criticality is achieved below the point of adding heat, reactor power will not be affected by the temperature change.

Answer: a

Test Item:	241	
Lesson Plan:	ROT-4-03	
Objective No.:	B1	
Objective:	State the purpose of and the breakers associated with cross-tie blocking.	
Reference:	AR-702	
K/A:	062 000 K1.02	AC Electrical Distribution Generic Emergency Diesel Generator
Task:	0620101004	Monitor the AC Electrical Distribution System
Importance:	4.1/4.4	
Expected Time (min):	2.0	

Which **ONE** of the following is a condition which will cause the "Diesel Gen B Parallel Block Act" light to be illuminated if the "A" DG Breaker is closed?

- a) Offsite Transformer is closed in to both ES buses.
- b) The Feeder to "A" 4160 ES bus from the Unit 3 Aux Transformer is closed with the Feeder to "B" 4160 ES bus from the Unit 3 S/U Transformer closed.
- c) The Feeder to "A" 4160 ES bus from the Offsite Transformer is closed with the Feeder to "B" 4160 ES bus from the Unit 3 S/U Transformer closed.
- d) The Feeder to "A" 4160 ES bus from the Unit 3 Aux Transformer is closed with the Feeder to "B" 4160 ES bus from the Offsite Transformer closed.

Answer: a

Test Item:	392	
Lesson Plan:	ROT-5-43	
Objective No.:	B2 & B4	
Objective:	<p>List from memory the federal quarterly whole body dose limits for radiation workers, non-radiation workers and persons under 18 years of age.</p> <p>Demonstrate the use of the formula $5(N-18)$ to determine an individual's exposure limits.</p>	
Reference:	HPP-300	
K/A:	Plant-Wide Generic #15	Knowledge of 10 CFR 20 and related facility radiation control requirements
Task:	119CS01010	Apply radiation and contamination safety procedure
Importance:	3.4/3.9	
Expected Time (min):	4.0	

A dose limit extension has been granted for a radiation worker at CR3 who has the following completed Whole Body dose history:

(NRC FORM FOUR)

AGE: 20 years old as of 6-6-91
ACCUMULATED DOSE: 9 Rem as of 12-31-91
No dose for current quarter
(assume today is 1-1-92)

Which **ONE** of the following is the maximum whole body exposure which this person could receive in the current quarter and not exceed the federal whole body dose limits?

- a. 1.0 Rem
- b. 1.25 Rem
- c. 2.5 Rem
- d. 3.0 Rem

Answer: b

Test Item:	328	
Lesson Plan:	ROT-5-16	
Objective No.:	3	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given Symptom, Immediate or Follow-up action.	
Reference:	EP-140	
K/A:	000	Emergency Plant Evolutions
	024	Emergency Boration
	EA2.06	When boration dilution is taking place
Task:	0000501018	Perform required actions for Emergency Reactivity Control
Importance:	3.6/3.7	
Expected Time (min):	2.0	

Test Item #19 (SRO B)

Point Value (1.0)

Which **ONE** of the following is the reason DW to the RB is isolated if RCS pressure is < 140 psig while in EP-140 "Emergency Reactivity Control"?

- a) Reduces the possibility of dilution from abnormal evolutions.
- b) Reduces the possibility of over filling the RCS at low pressures and temperatures.
- c) Reduces the possibility of filling the RCDT with DW and allowing that water to be transferred to a feed source supply tank for the RCS.
- d) Reduces the possibility of DW interfering with the sampling process for true boron concentration determination.

Answer: a

Test Item:	385	
Lesson Plan:	ROT-5-20	
Objective No.:	2	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given Symptom, Immediate, or Follow-up action.	
Reference:	EP-390	
K/S:	000 G27 EK8.07	Emergency Plant Evolutions Steam Generator Tube Leak Actions contained in EOP for S/G tube leak
Task:	0000501022 0020401001	Perform the required actions following a Steam Generator tube rupture. Perform actions required for excessive Reactor Coolant system leakage.
Importance:	4.2/4.4	
Expected Time (min):	1.75	

The plant is in a forced shutdown condition due to a steam generator tube leak. The leak is getting progressively worse and pressurizer level is becoming increasingly more difficult to maintain. EP-390, Steam Generator Tube Leak, provides guidance which directs the reactor to be tripped if pressurizer level cannot be maintained $\pm 100''$ with HPI.

Which **ONE** of the following conditions would result due to the tripping of the reactor at this point?

- a) A loss of adequate RCS pressure control.
- b) The PZR insurge can cause the PZR cooldown limits to be exceeded.
- c) If an MSSV should lift and fail to reseal, site boundary dose rates could be exceeded.
- d) The reactor coolant system would become saturated.

Answer: d

Test Item:	307	
Lesson Plan:	ROT-5-25	
Objective No.:	3	
Objective:	Given a copy of the Abnormal Procedure be able to state a basic reason for any given Symptom, Immediate, or Follow-up action.	
Reference:	AP-530, AP-380	
K/A:	000 Emergency Plant Evolutions 009 Small Break LOCA EK1.01 Natural circulation and cooling,including reflux boiling	
Task:	0000501010	Perform the actions required following an Engineered Safeguards System Actuation.
Importance:	4.2/4.7	
Expected Time (min):	5.0	

Given the following sequence of events:

- While operating at 100% FP, a small break LOCA occurs.
- The reactor trips and HPI actuates.
- Upon loss of SCM the RCPs are tripped.
- EFIC initiates and feeds both OTSGs to 95% on EFIC High Range.
- The reactor has a maximum decay heat output.
- Natural circulation can not be verified.

Which **ONE** of the following should be done to enhance natural circulation?

- a) Lower RCS pressure.
- b) Bump RCPs.
- c) Throttle HPI flow.
- d) Vent pressurizer.

Answer: b

Test Item:	141	
Lesson Plan:	ROT-5-73	
Objective No.:	2	
Objective:	Given a copy of the Abnormal Procedure be able to state a basic reason for any given Symptom, Immediate, or Followup Action.	
Reference:	EP-220	
K/A:	TH 193010 K1.06	
Task:	0000501019	Perform required actions for Pressurized Thermal Shock conditions
Importance:	3.6/3.8	
Expected Time (min):	2.5	

Given the following conditions:

- An overcooling event has occurred due to a failed MSSV.
- An OTSG tube leak was created by the MSSV failure.
- A reactor trip resulted from the overcooling.
- Twenty minutes after the reactor trip the plant conditions are:

Tc..... 365°F

RCS pressure... 1650 psig

Which **ONE** of the following actions must be taken?

- a) Reduce RCS pressure so the plant returns to the PTS operating region and continue plant cooldown maintaining emergency cooldown rate limits.
- b) Reduce RCS pressure so the plant returns to the PTS operating region and perform a three hour soak.
- c) Reduce RCS pressure so the plant returns to the PTS operating region and continue plant cooldown maintaining allowable cooldown rate limits.
- d) Allow the RCS to heatup to 475°F so the plant returns to the PTS operating region and perform a three hour soak.

Answer: c

Test Item:	380	
Lesson Plan:	ROT-5-78	
Objective No.:	B11	
Objective:	Given a copy of OP-301, explain what is being accomplished including the reason for any notes or cautions, as you respond to increased reactor coolant system leakage.	
Reference:	OP-301	
K/A:	002 000 A2.01	Reactor Coolant System Generic Loss of coolant inventory
Task:	0020401001	Perform actions required for excessive Reactor Coolant system leakage.
Importance:	4.3/4.4	
Expected Time (min):	3.0	

The plant is operating at 100% power. SP-317, RC System Water Inventory Balance, is being performed daily due to a large amount of identified leakage. The leakage data from the past week is as follows:

Day 1	3.5 gpm
Day 2	3.7 gpm
Day 3	4.1 gpm
Day 4	4.3 gpm
Day 5	4.5 gpm
Day 6	4.9 gpm
Day 7	6.0 gpm

Which **ONE** of the following describes the correct course of action based on the above listed data?

- a) Enter the Technical Specification action statement on identified leakage and continue operation.
- b) Perform SP-317 at least once per 24 hours and continue operation until Technical Specification limits are reached.
- c) Notify the Man on Call and consider a plant shutdown.
- d) Commence an immediate plant shutdown to Mode 3.

Answer: c

Test Item:	372	
Lesson Plan:	ROT-5-31	
Objective No.:	2	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given Symptom, Immediate or Follow-up action.	
Reference:	AP-990	
K/A:	062 000 A2.06	AC Electrical Distribution System Generic Keeping the safeguards buses electrically separate
Task:	0000501002	Perform the required actions to ensure plant safety during an emergency/abnormal event
Importance:	3.4/3.9	
Expected Time (min):	2.0	

Step 3.7 of AP-990, Shutdown From Outside Control Room, directs the operator to "Ensure Bkrs 3207 and 3208 are open and DC control power is off." Which **ONE** of the following is the reason for this step?

- a) Ensure local manual control of breakers 3207 and 3208 is available following Control Room evacuation.
- b) Ensure an inadvertent ES bus overload condition will not be created due to closure of multiple source feeder breakers.
- c) Ensure a fire induced fault would not cause closure of breakers 3207 and 3208, paralleling the Auxiliary transformer with the Start-up transformer.
- d) Ensure ES buses are not supplied by unprotected source feeder breakers since relay protection of breakers 3207 and 3208 is lost when control is transferred from the Control Room.

Answer: c

Test Item:	413	
Lesson Plan:	ROT-5-36	
Objective No.:	B3	
Objective:	Given EM-204A and the required data, be able to complete a dose assessment.	
Reference:	EM-204A	
K/A:	000 Emergency Plant Evolutions 060 Accidental Gaseous-Waste Release EK3.03 Actions contained in the EOP for accidental gaseous-waste release	
Task:	1150501001	Estimate off-site dose during a radiological release using EM-204 (A)
Importance:	3.8/4.2	
Expected Time (min):	4.5	

A large break LOCA has occurred. The present plant conditions are as follows:

OTSGs	dry and filling
RCS Pressure	725 psia
Tincore	690°F
RB Pressure	15 psia
RM-A2 Low Range	off scale high
RM-A2 Mid Range	70 mR/hr
RM-A2 Iodine	1000 cpm

An off-site dose assessment must be completed. The meteorological stability class has been determined to be F,G. Which **ONE** of the following would be the dose rate at the site boundary based on the listed data?

- a) $2.0E+3$ mR/hr
- b) $2.6E+3$ mR/hr
- c) $7.9E+4$ mR/hr
- d) $1.1E+5$ mR/hr

2.3×10^6

Answer: d

Test Item:	415	
Lesson Plan:	TRE-007	
	ROT-5-36	
Objective No.:	7	
	B3	
Objective:	<p>Explain the duties and responsibilities of the Emergency Coordinator as described in EM-202, Duties of the Emergency Coordinator.</p> <p>Given EM-204A and the required data, be able to complete a dose assessment.</p>	
Reference:	EM-204A, EM-202	
K/A:	<p>000 Emergency Plant Evolutions</p> <p>038 Steam Generator Tube Rupture</p> <p>EA2.04 Radiation levels</p> <p>System Ability to recognize abnormal indications</p> <p>Generic #10 for system operating parameters, which are</p> <p>Plant-Wide entry level conditions for emergency and</p> <p>Generic #36 abnormal operating procedures.</p> <p>Ability to take actions called for in the</p> <p>facility Emergency Plan, including</p> <p>supporting or acting as Emergency</p> <p>Coordinator.</p>	
Task:	3440403005	Classify Emergency events requiring E-Plan implementation and take actions to activate appropriate emergency response facility
Importance:	<p>3.9/4.2*</p> <p>4.5/4.5</p> <p>2.9*/4.7</p>	
Expected Time (min):	7.0	

Test Item #26 (SRO B)

Point Value (1.0)

A steam generator tube rupture has occurred coincident with a stuck open main steam safety valve (MSSV) on the same OTSG. The MSSV had opened 15 minutes ago and the maintenance department estimates that it will take an additional 15 minutes before the valve will be closed. The OTSG tube leak rate has been determined to be 160 gpm. The present plant conditions are as follows:

RCS Pressure	1200 psia
Tincore	650°F
RMG-25	18 mR/hr
RMG-26	0.8 mR/hr
RMG-27	16 mR/hr
RMG-28	0.9 mR/hr
Wind Speed	1½ m/sec
Stability Class	D

Which **ONE** of the following would be the proper emergency classification for this event?

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

Answer: c

Test Item:	315	
Lesson Plan:	TRE-007	
Objective No.:	7	
Objective:	Explain the duties and responsibilities of the Emergency Coordinator as described in EM-202, Duties of the Emergency Coordinator.	
Reference:	EM-202	
K/A:	Plant-Wide Generic #36	Ability to take actions called for in the Facility Emergency Plan, including supporting or acting as the Emergency Coordinator.
Task:	3440403005	Classify emergency events requiring E-plan implementation and take actions to activate appropriate emergency response facilities.
Importance:	2.9*/4.7	
Expected Time (min):	8.5	

A severe nuclear accident has occurred at the plant. An initial off-site dose assessment has been performed. The estimated doses are as follows:

	<u>Whole Body (mr)</u>	<u>Child Thyroid (mr)</u>
0.83 miles	5.60	7.0 E+3
2.00 miles	1.80	2.2 E+3
5.00 miles	0.52	653
10.00 miles	0.21	264

Which **ONE** of the following statements is the recommended protective actions for these estimated doses?

- a) 0 → 2 mile 360° evacuation / 2 → 5 mile evacuation of downwind sectors / 2 → 5 mile shelter of remaining sectors / 5 → 10 mile evacuate downwind sectors
- b) 0 → 2 mile 360° evacuation / 2 → 5 mile evacuation of downwind sectors / 5 → 10 mile shelter of remaining sectors
- c) 0 → 2 mile 360° evacuation / 2 → 5 mile evacuation of downwind sectors / 2 → 5 mile shelter of remaining sectors / 5 → 10 mile shelter of downwind sectors
- d) 0 → 5 mile 360° evacuation / 5 → 10 mile evacuation of downwind sectors / 5 → 10 mile shelter of remaining sectors

Answer: c

Test Item:	390	
Lesson Plan:	ROT-5-38	
Objective No.:	B4	
Objective:	State the requirements for the "Operator at the Controls" to remain in the red-carpeted general area of the Control Center.	
Reference:	AI-500	
K/A:	Plant-Wide Generic #29	Ability to coordinate personnel activities inside the control room.
Task:	NTS	
Importance:	3.1/4.7	
Expected Time (min):	1.5	

While in mode 1, with another reactor operator and the assistant shift supervisor present in the control room, a plant transient occurs. The ANSS directs the other reactor operator to leave the control room to complete a task that has some urgency. The ANSS then goes to get MET tower data to complete EM-204A. You now notice that the NNI-X power supply light on the redundant instrument panel is off.

Which **ONE** of the following statements describes your administrative ability to leave the red carpeted area to check the status of this power supply?

- a. You cannot leave the area; at least one operator must be in the red carpeted area at all times while in mode 1.
- b. You can leave the area as long as you have SSOD permission.
- c. You cannot leave the area since an unobstructed view of the main control board cannot be maintained.
- d. You can leave the area; there are no obstructions between the NNI power supplies and the main control board.

Answer: c

Test Item:	396	
Lesson Plan:	ROT-5-02	
Objective No.:	B1	
Objective:	<p>Given a limit and precaution from one of the operating procedures, explain the basis:</p> <p>d.OP-204</p>	
Reference:	STS 3.7.1.5 and 3.7.1.1	
K/A	<p>039 Main and Reheat Steam System</p> <p>000 Generic</p> <p>System Knowledge of the Technical Specifications</p> <p>Generic #5 bases and definitions related to limiting conditions for operation and safety limits.</p>	
Task:	0390101009	Monitor the Main and Reheat Steam System
Importance:	3.1/3.7	
Expected Time (min):	3.6	

A plant startup is in progress with reactor power at 40%. A problem in the Intermediate Building has caused damage to MSV-38 and MSV-43 (MSSVs). It has been estimated that it will be 2 days before these two valves will be returned to service. MSV-40 (a MSSV) was slightly damaged during the same incident however it can be repaired and returned to service within the next 2½ hours. MSV-412 (a MSIV) has also been damaged and is in the closed position. It will be 30 hours before MSV-412 can be opened.

Which **ONE** of the following is the correct course of action based on the above conditions?

- a) Power escalation may continue to 67% but will require the overpower trip set point to be set at 67.5%.
- b) Power escalation must be halted and MSV-412 returned to operable status or the plant must be taken to Hot Shutdown within 12 hours.
- c) Power escalation must be halted prior to reaching 67.5% until either MSV-40 and either MSV-38 or MSV-43, or MSV-412 is returned to operable status, or STS 3.0.3 must be applied.
- d) Power escalation may continue to 60%, MSV-412 must be declared inoperable, and the high flux trip setpoint must be set to 81%.

Answer: d

Test Item:	368	
Lesson Plan:	ROT-5-78	
Objective No.:	B1	
Objective:	Apply limits and precautions from OP-301, including their basis.	
Reference:	OP-301	
K/A:	000 074 EK1.03	Emergency Plant Evolutions Inadequate Core Cooling Processes for removing decay heat from the core
Task:	0020101005 0020101009	Drain and nitrogen blanket the Reactor Coolant System. Monitor the Reactor Coolant System.
Importance:	4.5/4.9	
Expected Time (min):	4.5	

Given the following conditions:

- The reactor was shutdown at 0000 (midnight) on Dec. 2, 1990.
- Today is Dec. 8, 1990 and the time is 0800.
- The RCS has been depressurized in preparation for head removal.
- The vessel has been drained to a level just above the flange but not yet low enough for head removal.
- In preparation for refueling the incore instruments have been withdrawn from the core region.
- A total loss of Decay Heat Removal has occurred.
- Just prior to the loss of Decay Heat Removal RCS temperature was 70°F.

Which **ONE** of the following is the approximate time it is expected to take to reach 212°F (boiling) in the core?

- a) 22 minutes
- b) 27 minutes
- c) 35 minutes
- d) 39 minutes

Answer: d

Test Item:	351	
Lesson Plan:	ROT-5-81	
Objective No.:	B1	
Objective:	State the entry level conditions for this Abnormal Procedure.	
Reference:	AP-581	
K/A:	016 000 A2.02	Non-Nuclear Instrumentation System Generic Loss of power supply
Task:	0160401002	Perform required actions for a loss of power to the NNI system.
Importance:	2.9*/3.2*	
Expected Time (min):	1.5	

Which **ONE** of the statements below is correct concerning a loss of NNI-X?

- a) A failure of the NNI-X ABT output is considered a loss of NNI-X.
- b) Only components powered from VBDP-1, VBDP-3, and VBDP-5 will be affected by a loss of NNI-X.
- c) The interlock functions associated with MUV-49 are unaffected by a loss of NNI-X DC power.
- d) A loss of NNI-X DC power can be confirmed by the absence of any 1 of the 4 indicating lights located in NNI Cabinet 3.

Answer: a

ATTACHMENT 3

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ANSWER KEY COVER SHEET

TRAINING PROGRAM TITLE: LICENSED OPERATOR REQUALIFICATION

EXAMINATION TITLE: LICENSED OPERATOR REQUALIFICATION - CATEGORY A

EXAMINATION NAME OR NUMBER: 1992 CATEGORY A RO EXAM

PREPARER:

RC Jones Ronald A. Ly

DATE:

11/10/92

APPROVAL:

Johnnie Smith
Nuclear Training Supervisor

DATE:

11-10-92

INSTRUCTIONS FOR TAKING THE EXAMINATION

1. Use black ink or dark pencil only to ensure legible copies.
2. Ensure your name is printed in the blank provided on the cover sheet of the examination and the answer sheet.
3. Each question has only **ONE** correct answer. Mark your answers on the answer sheet provided and do not leave any question blank. If additional paper is required, use only the lined paper provided by the examiner.
4. All questions are worth 1.0 point.
5. If parts of the examination are not clear with respect to their intent, ask questions of the examiner only.
6. The examination is designed to take approximately 45 minutes to complete. You will be given **1 HOUR** to complete the examination.
7. The questions have been time validated by knowledgeable persons. You should be aware that not every answer needs to be verified by consulting a reference and excessive usage of reference material may cause you to not complete the examination in the allotted time.
8. Restroom trips are limited and only one examinee at a time may leave. You must avoid all contact with anyone outside the examination room to avoid even the appearance or possibility of examination compromise.
9. Cheating on the examination could result in revocation of your license and may result in more severe penalties.
10. You must sign the statement on the cover sheet that indicates the work on the examination is your own and that you have not received or been given any assistance in completing the examination. This must be signed **AFTER** the examination has been completed.
11. When you are finished and have turned in your completed examination, leave the examination area.

I. SCENARIO OVERVIEW

The unit was operating at 100% power, MOL. I&C was performing SP-110 in the "A" RPS channel. A large steam break occurred on the OTSG-1B outside the RB and upstream of the MSIVs. FWP-2B failed to trip from the EFIC FW Isolation. CAV-5 failed to close on the ES actuation. RWP-2B failed to start on the ES actuation.

INSTRUCTOR NOTE: Examines must not be present during setup.

II. INITIAL CONDITIONS:

Initialize the simulator to 100% power MOL.

III. CONTROL BOARD SETUP:

1. ___ Perform a lamp check using panel diagnostics.
2. ___ Un-freeze the simulator.
3. ___ Ensure SPDS screens are selected properly for current conditions. (Δ Flux on left screen and Normal on right screen)
4. ___ Ensure computer screens are selected for proper groups for current conditions. (Group 59 on the right screen and group 108 on the left screen)
5. ___ Freeze the simulator.
6. ___ Ensure all charts are inking.
7. ___ Advance and mark all charts.
8. ___ Advance line printer paper.
9. ___ Advance annunciator typer paper and remove used sheets.
10. ___ Un-freeze the simulator and allow to run for 5 min.
11. ___ Freeze the simulator.

IV. SCENARIO SETUP:

1. ___ **Fail** CAV-5 open (I/F page 742)
2. ___ **Fail** Open RWP-2B breaker (I/F page 654)
3. ___ **Prevent** the B MFWP from tripping (I/F page 638) Auto trip failure/T.
4. ___ **Arm**, Numbered Malfunction MS-002B ("B" MS line break), set to 0.3.
5. ___ Unfreeze the simulator.
6. ___ Place the "A" RPS channel into "Manual Bypass" and place the test module for RCS pressure in the "A" RPS channel into Test Operate position.
7. ___ Freeze the simulator and take a snap-shot.
8. ___ Unfreeze the simulator.
9. ___ Select PZR spray valve to manual and open valve fully.
10. ___ Activate the stack when the low RCS pressure alarm comes in.
11. ___ Perform the following procedural actions:
 - a) After HPI is actuated, select PZR spray valve to Auto.
12. ___ Allow the simulator to run until RCS pressure is 2200 psi as indicated on the lower portion I/F screen. Acknowledge annunciator alarms and freeze the simulator ensuring that all active annunciator alarms are on.

V. PRE-EXAM REVIEW:

1. ___ Verify validity of Exam answer key to the frozen simulator.
2. ___ Resolve any discrepancies.

VI. SHIFT TURNOVER

1. ___ Recall examinees into simulator room.
2. ___ Review rules of the exam.
3. ___ Handout Information Sheet to each examinee.
4. ___ Review Information Sheet with examinees.
5. ___ Allow examinees to perform a 5 min. walkdown of the MCB.
6. ___ Handout the examination.
7. ___ Announce exam start time. Time: _____
8. ___ Announce exam stop time. Time: _____

INFORMATION SHEET

INITIAL CONDITIONS:

The plant operating at 100% power, at 210 EFPD.
I&C performing SP-110 in "A" RPS channel.

TRANSIENT DESCRIPTION:

A large steamline/feedline break has occurred on the "B" Steam Generator. RM-A12 is out of service.

OPERATOR ACTIONS TAKEN:

None

ELAPSED TIME:

Approximately 5 min since the rapid de-pressurization of the B OTSG.

Test Item:	SSE-02/01
Lesson Plan:	ROT-5-63
Objective No.:	B3
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given symptom, immediate or follow-up action.
Reference:	AP-380
K/A:	000 Emergency Plant Evolutions 009 Small Break LOCA EA1.18 Balancing HPI loop flows
Task:	0040501002 Control High Pressure Injection flow rate
Importance:	3.4/3.2
Expected Time (min):	2.0

Based on current plant conditions, which **ONE** of the following statements correctly describes the steps required to BALANCE HPI flows?

- a) Select "HPI RC-1", "HPI RC-2" and "HPI RC-3" hand switches to "BYPASS"; close MUV-27 and adjust HPI flows as necessary.
- b) Select "HPI RC-1", "HPI RC-2" and "HPI RC-3" hand switches to "RESET"; close MUV-27 and adjust HPI flows as necessary.
- c) "RESET" 1500# bistables in ES channels 1, 2 and 3, close MUV-27 and adjust HPI flows as necessary.
- d) Close MUV-27 and adjust HPI flows as necessary; no additional steps are required.

Answer: c

Test Item:	SSE-02/02
Lesson Plan:	ROT-5-65
Objective No.:	B2
Objective:	State the Immediate Actions of this abnormal procedure.
Reference:	AP-460
K/A:	000 Emergency Plant Evolutions 040 Steam Line Rupture EA1.02 Feedwater isolation
Task:	0190401002 Perform required actions for a malfunction of the EFIC system including spurious actuation and failure to actuate
Importance:	4.5/4.5
Expected Time (min):	1.5

Test item: #2 (RO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following statements with respect to the "B" Main Feedwater Pump (FWP-2B) is correct?

- a) "B" MFWP (FWP-2B) should be tripped due to actuation of "B" train Main Feedwater Isolation.
- b) "B" MFWP (FWP-2B) should be tripped due to actuation of "B" train Main Steam Line Isolation.
- c) "B" MFWP (FWP-2B) should be tripped due to actuation of "B" train Emergency Feedwater.
- d) "B" MFWP (FWP-2B) should NOT be tripped.

Answer: a

Test Item:	SSE-02/04	
Lesson Plan:	ROT-5-63	
Objective No.:	B2	
Objective:	List from memory the immediate actions required by this Abnormal Procedure.	
Reference:	AP-380	
K/A:	000	Emergency Plant Evolutions
	009	Small Break LOCA
	EK3.26	Maintenance of RCS subcooling
Task:	0000501006	Perform the actions to ensure core cooling and subcooling margin are maintained during an emergency event.
Importance:	4.4/4.5	
Expected Time (min):	1.5	

Test Item: #3 (RO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following is the required sub-cooling margin?

- a) 20°F
- b) 30°F
- c) 50°F
- d) In accordance with the SPDS curve

Answer: b

Test Item:	SSE-02/06	
Lesson Plan:	ROT-5-65	
Objective No.:	B3	
Objective:	Given a copy of the Abnormal Procedure be able to state a basic reason for any given Symptom or Follow-up action.	
Reference:	AP-460	
K/A:	000 Emergency Plant Evolutions 040 Small Break LOCA EK3.04 Actions contained in the EOP for a steam line rupture	
Task:	0000501002	Perform the actions required to ensure the plant safety during an emergency/abnormal event.
Importance:	4.5/4.7	
Expected Time (min):	1.5	

Based on current plant conditions, which **ONE** of the following statements is correct concerning OTSG operability as defined in STS?

- a) No actions are required, both OTSGs are operable
- b) No actions are required due to current plant Mode
- c) Both OTSG are inoperable, STS requires both OTSGs be restored to operable status prior to increasing Tave
- d) OTSG "B" is inoperable, STS requires Cold Shutdown within the next 30 hours

Answer: d

Test Item:	SSE-02/06	
Lesson Plan:	ROT-5-65	
Objective No.:	B3	
Objective:	Given a copy of the Abnormal Procedure be able to state a basic reason for any given Symptom or Follow-up action.	
Reference:	AP-460	
K/A:	000 040 EKS.04	Emergency Plant Evolutions Small Break LOCA Actions contained in the EOP for a steam line rupture
Task:	0000501002	Perform the actions required to ensure the plant safety during an emergency/abnormal event.
Importance:	4.5/4.7	
Expected Time (min):	1.5	

In response to the OTSG de-pressurization, you enter AP-460, Steam Generator Isolation Actuation. Step 3.6 requires that both CC chillers and their chilled water pumps are secured. Which **ONE** of the following statements describes the reason for this step?

- a) Chilled water pump motors may be damaged due to high humidity.
- b) Increased SW flow to the chillers can cause excessive cooling of the penetrations.
- c) Chillers have control circuits located in the intermediate building which may be affected by high humidity.
- d) Chillers could become overloaded by increased heat loads from the penetration cooling system.

Answer: d

Test Item:	SSE-02/67	
Lesson Plan:	ROT-5-65	
Objective No.:	B3	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given symptom or follow-up action.	
Reference:	AP-460	
K/A:	035	Steam Generator System
	010	Startup/Shutdown
	A2.01	Faulted or ruptured SG
Task:	0000501012	Perform the required actions following a steam generator isolation actuation.
Importance:	4.5/4.6	
Expected Time (min):	2.25	

Test item: #6 (SRO A)

Point Value (1.0)

A plant cooldown will be required to repair the break. Based on current plant conditions, which **ONE** of the following correctly identifies the OTSG Tube to Shell Delta T limit?

- a) 60 °F
- b) 70 °F
- c) 100 °F
- d) 150 °F

Answer: c

Test Item:	SSE-02/10	
Lesson Plan:	ROT-5-47	
Objective No.:	19	
Objective:	Given Enclosure 1 of EM-202, correctly identify the emergency classification from a list of specific conditions.	
Reference:	EM-202	
K/A:	000 040 System Generic #3	Emergency Plant Evolutions Steam Line Rupture Knowledge of which events related to system operation/status should be reported.
Task:	0000501001	Analyze indications to determine that an emergency/abnormal plant event is in progress.
Importance:	3.7	
Expected Time (min):	2.25	

Test item: #7 (SRO A)

Point Value (1.0)

If a 60 gpm tube leak in the "A" OTSG were to occur simultaneously with the current plant conditions, which **ONE** of the following Emergency Classifications should be declared?

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

Answer: b

Test Item:	SSE-02/12
Lesson Plan:	ROT-4-15
Objective No.:	B12
Objective:	<p>Briefly describe the operator actions required to:</p> <ul style="list-style-type: none"> - Manually initiate EFW - Regain control of EFIC/EFW components after EFW has been automatically or manually initiated - Shutdown the EFW system after initiation
Reference:	
K/A:	<p>061 Auxiliary/Emergency Feedwater System</p> <p>000 Generic</p> <p>A3.04 Automatic AFW isolation</p>
Task:	<p>0190401003 Reset/bypass EFIC logic following EFIC actuation.</p>
Importance:	4.1/4.2
Expected Time (min):	3.0

Test item: #8 (SRO A)

Point Value (1.0)

Based on current plant conditions, which ~~ONE~~ of the following statements correctly describes the minimum actions which must be taken to regain control of EFV-14?

- a) EFIC channel "A" "Test Results Reset" P/B must be depressed.
- b) EFIC channel "A" "Man Permissive" P/B must be depressed.
- c) Both EFIC channels "Tests Results Reset" P/Bs must be depressed.
- d) Both EFIC channels "Man Permissive" P/Bs must be depressed.

Answer: d

Test Item:	SSE-02/15	
Lesson Plan:	ROT-4-12	
Objective No.:	B3 (H)	
Objective:	Describe the location and/or operation of the following components: H. Reactor Trip Module	
Reference:		
K/A:	012 000 A3.07	Reactor Protection System Generic Trip breakers
Task:	0120101005	Monitor the Reactor Protection System.
Importance:	4.0/4.0	
Expected Time (min):	2.25	

Test item: #4 (RO A)

Point Value (1.0)

In response to the OTSG de-pressurization, you enter AP-460, Steam Generator Isolation Actuation. Step 3.6 requires that both CC chillers and their chilled water pumps are secured. Which **ONE** of the following statements describes the reason for this step?

- a) Chilled water pump motors may be damaged due to high humidity.
- b) Increased SW flow to the chillers can cause excessive cooling of the penetrations.
- c) Chillers have control circuits located in the intermediate building which may be affected by high humidity.
- d) Chillers could become overloaded by increased heat loads from the penetration cooling system.

Answer: d

Test Item:	SSE-02/07
Lesson Plan:	ROT-5-65
Objective No.:	B3
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given symptom or follow-up action.
Reference:	AP-460
K/A:	<div>035 Steam Generator System</div> <div>010 Startup/Shutdown</div> <div>A2.01 Faulted or ruptured SG</div>
Task:	<div>0000501012</div> <div>Perform the required actions following a steam generator isolation actuation.</div>
Importance:	4.5/4.6
Expected Time (min):	2.25

Test item: #5 (RO A)

Point Value (1.0)

A plant cooldown will be required to repair the break. Based on current plant conditions, which **ONE** of the following correctly identifies the OTSG Tube to Shell Delta T limit?

- a) 60 °F
- b) 70 °F
- c) 100 °F
- d) 150 °F

Answer: c

Test Item:	SSE-02/12
Lesson Plan:	ROT-4-15
Objective No.:	B12
Objective:	<p>Briefly describe the operator actions required to:</p> <ul style="list-style-type: none"> - Manually initiate EFW - Regain control of EFIC/EFW components after EFW has been automatically or manually initiated - Shutdown the EFW system after initiation
Reference:	
K/A:	<p>061 Auxiliary/Emergency Feedwater System</p> <p>000 Generic</p> <p>A3.04 Automatic AFW isolation</p>
Task:	<p>0190401003 Reset/bypass EFIC logic following EFIC actuation.</p>
Importance:	4.1/4.2
Expected Time (min):	3.0

Test item: #6 (RO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following statements correctly describes the minimum actions which must be taken to regain control of EFV-14?

- a) EFIC channel "A" "Test Results Reset" P/B must be depressed.
- b) EFIC channel "A" "Man Permissive" P/B must be depressed.
- c) Both EFIC channels "Tests Results Reset" P/Bs must be depressed.
- d) Both EFIC channels "Man Permissive" P/Bs must be depressed.

Answer: d

Test Item:	SSE-02/14	
Lesson Plan:	ROT-4-06	
Objective No.:	B4	
Objective:	Describe the operation of the Emergency Diesel Generator: a) Startup 1) Automatic 2) Manual b) Shutdown	
Reference:	SP-354A	
K/A:	064 Emergency Diesel Generator System 000 Generic A2.03 Parallel operation of the ED/Gs	
Task:	0000501014	Perform the required actions following an Emergency Diesel Generator actuation.
Importance:	3.1/3.1	
Expected Time (min):	2.25	

Test item: #9 (SRO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following statements describe what is indicated by the RED "Reactor Trip" light inside the "C" RPS channel on the 880 Trip module being bright?

- a) "C" RPS Channel is tripped
- b) Three RPS channels are tripped
- c) "C" CRDM breaker is open OR the "E" Electronic Trip has actuated
- d) "C" CRDM breaker is open AND the "E" Electronic Trip has actuated

Answer: d

Test Item:	SSE-02/16	
Lesson Plan:	ROT-4-28	
Objective No.:	B17(a)	
Objective:	Discuss the indications and the effects of the following lamps on the Diamond Control Panel: a. Trip Confirm	
Reference:		
K/A:	001 Control Rod Drive 000 Generic K6.03 Reactor trip breakers including controls	
Task:	0010101009	Monitor the Control Rod Drive System
Importance:	3.7/4.2	
Expected Time (min):	1.5	

Based on current plant conditions, which **ONE** of the following statements correctly describes the condition that is causing the TRIP CONFIRM lamp on the CRDM control panel to be "ON"?

- a) Three RPS channels are tripped.
- b) Rx Trip Lockout is tripped.
- c) All control rods (groups 1 through 7) are fully inserted.
- d) All CRDM breakers (A, B, C, D) are open and both Electronic Trips (E, F) are present.

Answer: d

Test Item:	SSE-02/new
Lesson Plan:	ROT-4-06
Objective No.:	B2
Objective:	Describe the location/function of the controls and indications available for the diesel generators.
Reference:	
K/A:	064 Emergency Diesel Generator System 000 Generic A3.03 Indicating lights, meters, and recorders
Task:	0640101004 Monitor the Emergency Diesel Generator 0640101002 Start an Emergency Diesel Generator
Importance:	3.4/3.4
Expected Time (min):	1.5

Test item: #11 (SRO A)

Point Value (1.0)

Based on current plant conditions, if breaker 3209 were closed, which **ONE** of the following 4160V ES bus "B" feeder breakers would be blocked by the cross-tie blocking logic?

- a) 3206
- b) 3208
- c) 3210
- d) 3212

Answer: c

Test Item:	SSE-02/18	
Lesson Plan:	ROT-4-10	
Objective No.:	B3	
Objective:	From memory, list all protective interlocks and control features associated with the NIS.	
Reference:	OP-210	
K/A:	015	Nuclear Instrumentation System
	000	Generic
	K4.01	Source Range detector power shutoff at high powers
Task:	0150101001	Verify function operation of the Nuclear Instrumentation System
Importance:	3.1/3.3	
Expected Time (min):	3.0	

Test item: #12 (SRO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following statements correctly describes the minimum conditions necessary for source range NIs (NI-1, NI-2) to re-energize?

- a) Both NI-3 and NI-4 will have to drop to $\leq 1 \times 10^{-9}$ amps
- b) Both NI-3 and NI-4 will have to drop to $\leq 5 \times 10^{-10}$ amps
- c) Only NI-3 or NI-4 will have to drop to $\leq 1 \times 10^{-9}$ amps
- d) Only NI-3 or NI-4 will have to drop to $\leq 5 \times 10^{-10}$ amps

Answer: d

Test Item:	SSE-02/24
Lesson Plan:	ROT-5-80
Objective No.:	A2
Objective:	Given a copy of the Abnormal Procedure be able to state the basic reason for any given Symptom or Follow up step and determine the applicability of the step for various transient scenarios.
Reference:	AP-790
K/A:	<div>062 AC Electrical Distribution System</div> <div>000 Generic</div> <div>K4.01 Bus lockouts</div>
Task:	0620101001 Lineup the electrical distribution system
Importance:	2.6/3.2
Expected Time (min):	4.0

Test item: #13 (SRO A)

Point Value (1.0)

Based on current plant conditions, if breaker 3209 ("A" EDG output breaker) were closed, which **ONE** of the following would be the expected?

- a) Only the "480 ES Bus 3A UV Lockout" would trip.
- b) Only the "4160 ES Bus 3A ES/UV Block Lockout Actuated" would actuate.
- c) Both the "480 ES Bus 3A UV Lockout" would trip and the "4160 ES Bus 3A ES/UV Block Lockout Actuated" would actuate.
- d) Neither the "480 ES Bus 3A UV Lockout" would trip nor the "4160 ES Bus 3A ES/UV Block Lockout Actuated" would actuate.

Answer: a

Questions 14 through 18 are GENERIC questions.

DO NOT base your answers on the static freeze point.

Test Item:	SSE-G031	
Lesson Plan:	ROT-4-63	
Objective No.:	B1	
Objective:	<p>DESCRIBE THE LOCATION AND/OR OPERATION OF THE FOLLOWING SYSTEM INSTRUMENTATION:</p> <p>A. RM-A1, Reactor Building Purge Duct Monitor</p>	
Reference:		
K/A:	<p>029 Containment Purge System</p> <p>000 Generic</p> <p>K4.03 Automatic purge isolation</p>	
Task:	0880401006	Verify proper operation of the plant ventilation system following high radiation in the reactor building.
Importance:	3.2/3.5	
Expected Time (min):	2.0	

Which **ONE** of the following describes the expected response when RM-A1 actuates during shutdown operations (Mode 5)?

- a) Purge supply fans will continue to run and the exhaust fans will stop, and purge supply and the exhaust valves will remain open.
- b) Purge supply and exhaust fans will stop and purge supply and the exhaust valves will close.
- c) Purge supply fans will stop and the exhaust fans will continue to run, and purge supply and the exhaust valves will remain open.
- d) Purge supply and exhaust fans will continue to run and the supply and exhaust valves will close.

ANSWER: d

Test Item:	SSE-G084	
Lesson Plan:	ROT-4-15	
Objective No.:	B18	
Objective:	Describe the interlocks that exist in the EFIC system, and between the EFIC system and the RPS with regard to the channel maintenance bypass function.	
Reference:		
K/A:	061 Auxiliary/Emergency Feedwater System 000 Generic System Knowledge of system purpose and/or Generic #4 function	
Task:	0190101001	Monitor the EFIC system
Importance:	4.0/4.0	
Expected Time (min):	4.0	

When the RPS is placed in shutdown bypass, which **ONE** of the following statements describes the interlock that exists between the RPS and EFIC systems.

- a) Only the "OTSG Low Level" interlock is bypassed.
- b) Only the EFIC "Both Main Feed Pumps Tripped" interlock is bypassed.
- c) Both the "OTSG Low Pressure" and "OTSG Low Level" interlocks are bypassed.
- d) Both the "OTSG Low Pressure" and "Both Main Feed Pumps Tripped" interlocks are bypassed.

Answer: b

Test Item:	SSE-G033	
Lesson Plan:	ROT-4-07	
Objective No.:	G13	
Objective:	Describe the Halon System including the following items at a minimum: A. Number of cylinders. B. Number of banks. C. Type of halon used. D. Number of detectors needed to actuate the system.	
Reference:		
K/A:	086 000 K4.05	Fire Protection System Generic Halon
Task:	0860104003 0860204007	Monitor the fire protection system Perform SP-363, Fire Protection System tests
Importance:	3.0/3.4	
Expected Time (min):	2.0	

Test item: #16 (SRO A)

Point Value (1.0)

Which **ONE** of the following describes the minimum required to actuate the Halon Fire Suppression System in the Cable Spreading room?

- a) An alarm from any two detectors in the same zone.
- b) An alarm from one detector in either zone.
- c) An alarm from one detector in each zone.
- d) An alarm from two detectors from each zone.

ANSWER: c

Test Item:	SSE-G053	
Lesson Plan:	ROT-2-05	
Objective No.:	B2	
Objective:	Sketch the RCS and steam temperature profiles for 0% to 100% power and explain the shape of the curves.	
Reference:		
K/A:	002 Reactor Coolant System 000 Generic K5.15 Relationships between effects in the primary coolant system and the secondary coolant system	
Task:	10 CFR 55	
Importance:	4.0/4.2	
Expected Time (min):	3.5	

Which **ONE** of the following statements describes the effect on the primary system parameters as power is increased in the 0 → 15% power range with the Turbine Header Pressure controller incorrectly set to control at 850 psig?

- a) Initial Tc would be the same. RCS ΔT would be increased for a given power level. A lower power would be required to reach a Tave of 579°F.
- b) Initial Tc would be the same. RCS ΔT would remain the same for a given power level. The higher power would be required to reach a Tave of 579°F.
- c) Initial Tc would be lower. RCS ΔT would be increased for a given power level. A lower power would be required to reach a Tave of 579°F.
- d) Initial Tc would be lower. RCS ΔT would remain the same for a given power. A higher power would be required to reach a Tave of 579°F.

ANSWER: d

Test Item:	SSE-G047
Lesson Plan:	ROT-4-56
Objective No.:	B3
Objective:	State the controls, interlocks, function, location, and power supply of the following: a. SW Pumps (SWP-1A/1B/1C)
Reference:	
K/A:	008 Component Cooling Water System 000 Generic K4.01 Automatic start of standby pump
Task:	0080101004 Start the SW system 0080101006 Operate the nuclear services booster pumps 0080101009 Monitor the SW system
Importance:	3.1/3.3
Expected Time (min):	2.0

Which **ONE** of the following describes how the SW pump will respond when a loss of offsite power occurs coincident with HPI actuation?

- a) The pumps will be prevented from auto start until all ES equipment has loaded on to the bus.
- b) As soon as power is restored the SW pumps (1A/1B) will automatically start due to the low pressure condition.
- c) The automatic start on low pressure will be prevented, but the pumps will auto start when block loaded by the ES system.
- d) The operator will have a permissive to restart either SWP-1A or SWP-1B, but the automatic start will be totally blocked.

ANSWER: c

ATTACHMENT 3

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ANSWER KEY COVER SHEET

TRAINING PROGRAM TITLE: LICENSED OPERATOR REQUALIFICATION

EXAMINATION TITLE: LICENSED OPERATOR REQUALIFICATION - CATEGORY B

EXAMINATION NAME OR NUMBER: 1992 CATEGORY B SRO EXAM

PREPARER:

Robert R. Roubicek

DATE:

11/10/92

APPROVAL:

Johnnie Smuler
Nuclear Training Supervisor

DATE:

11-10-92

INSTRUCTIONS FOR TAKING THE EXAMINATION

1. Use black ink or dark pencil only to ensure legible copies.
2. Ensure your name is printed in the blank provided on the cover sheet of the examination and the answer sheet.
3. Each question has only **ONE** correct answer. Mark your answers on the answer sheet provided and do not leave any question blank. If additional paper is required, use only the lined paper provided by the examiner.
4. All questions are worth 1.0 point.
5. If parts of the examination are not clear with respect to their intent, ask questions of the examiner only.
6. The examination is designed to take approximately 90 minutes to complete. You will be given **2 HOURS** to complete the examination.
7. The questions have been time validated by knowledgeable persons. You should be aware that not every answer needs to be verified by consulting a reference and excessive usage of reference material may cause you to not complete the examination in the allotted time.
8. Restroom trips are limited and only one examinee at a time may leave. You must avoid all contact with anyone outside the examination room to avoid even the appearance or possibility of examination compromise.
9. Cheating on the examination could result in revocation of your license and may result in more severe penalties.
10. You must sign the statement on the cover sheet that indicates the work on the examination is your own and that you have not received or been given any assistance in completing the examination. This must be signed **AFTER** the examination has been completed.
11. When you are finished and have turned in your completed examination, leave the examination area.

Test Item:	133	
Lesson Plan:	ROT-5-36	
Objective No.:	B3	
Objective:	Given EM-204A and the required data, be able to complete a dose assessment.	
Reference:	EM-204A	
K/A:	000 Emergency Plant Evolutions 038 Steam Generator Tube Rupture System Knowledge of system status criteria which Generic #2 require the notification of plant supervisors or off-plant personnel.	
Task:	1150501001	Estimate off-site dose during a radiological release using EM-204(A).
Importance:	3.0/3.9	
Expected Time (min):	4.5	

Test Item #1 (SRO B)

Point Value (1.0)

A steam generator tube rupture has occurred. There is a release in progress through the condenser exhaust line. The plant has been placed in a stable condition and an off-site initial dose assessment is to be completed. The following data is provided:

- Avg. Wind Direction 315°
- Wind Range 50°
- Wind Speed 3 m/sec
- Delta-T -1.2°F

Which **ONE** of the following is the weather condition "Stability Class"?

- a) Stability Class "B"
- b) Stability Class "C"
- c) Stability Class "D"
- d) Stability Class "F,G"

Answer:

b

RCB
11/16/92

Test Item:	036
Lesson Plan:	ROT-5-62
Objective No.:	2
Objective:	Given a copy of the Abnormal Procedure be able to state a basic reason for any given Symptom or Follow up action.
Reference:	AP-360
K/A:	000 Emergency Plant Evolutions 025 Loss of Residual Heat Removal System EK3.01 Shift to alternate flow path
Task:	0050401001 Perform the required actions for a loss of decay heat removal.
Importance:	3.1/3.4
Expected Time (min):	4.0

Test Item #2 (SRO B)

Point Value (1.0)

Given the following conditions:

- A loss of both Decay Heat removal pumps has occurred
- RCS pressure is 125 psig
- RCS temperature is 130°F
- Both OTSGs are available
- The RCS is completely filled and PZR level is 60 inches

Which **ONE** of the following alternate cooling methods should the operator use?

- a) OTSG cooling
- b) Spent Fuel cooling
- c) HPI cooling
- d) BWST drain through LPI to vessel

Answer: a

Test Item:	374	
Lesson Plan:	ROT-5-64	
Objective No.:	B3	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given Symptom, Immediate or Follow-up action.	
Reference:	AP-450	
K/A:	059 000 K1.03	Main Feedwater System Generic Steam Generators
Task:	0000501010 0000501006	Perform the required actions following an Engineered Safeguards actuation. Perform the actions to ensure that core cooling and subcooling margin are maintained during an emergency event.
Importance:	3.1/3.3	
Expected Time (min):	2.5	

Test Item #3 (SRO B)

Point Value (1.0)

Following a loss of the Unit 4160 VAC and 6900 VAC buses due to a fire, Emergency Feedwater is lost. The decision is made to use Main Feedwater to feed the OTSGs. The following plant conditions exist:

- ☐ Level in both OTSGs = 12 inches
- ☐ Pressure in both OTSGs = 800 psig
- ☐ RCS temperature = 525°F
- ☐ Feedwater temperature = 135°F
- ☐ "A" Unit 4160 VAC Bus energized
(other unit buses are de-energized)
- ☐ "A" MFP operating in recirculation

Which **ONE** of the following would be the correct method for feeding the OTSGs?

- a) Feed OTSGs through the high nozzles at ≈ 1000 gpm/OTSG
- b) Feed OTSGs through the lower nozzles at ≈ 1000 gpm/OTSG
- c) Feed OTSGs through the high nozzles at ≈ 1500 gpm/OTSG
- d) Feed OTSGs through the lower nozzles at ≈ 500 gpm/OTSG

Answer: a

Test Item:	096
Lesson Plan:	ROT-5-01
Objective No.:	A1
Objective:	Given a copy of Technical Specifications and Technical Specification Interpretation, clarify and/or interpret STS requirements.
Reference:	STS 3.0.4/3.9.2, TSI 86-10, Table 1.1
K/A:	<div>015 Nuclear Instrumentation System</div> <div>000 Generic</div> <div>System Knowledge of Technical Specifications</div> <div>Generic #5 bases and definitions related to limiting conditions for operations and safety limits.</div>
Task:	<div>3410103036 Evaluate plant systems performance and coordinate actions per STS in the event a LCO is entered/not satisfied.</div>
Importance:	3.3/3.8
Expected Time (min):	4.0

The following conditions exist:

- The plant is in Mode 5 and refueling preparations are underway.
- Due to problems with the Public Address System, audible source range indication is not operable in the Reactor Building.
- The outage shift manager wants to start detensioning the head bolts.

Which **ONE** of the following statements correctly assesses this situation?

- a) The head bolts may be detensioned. Audible source range indication is only required during core alterations or positive reactivity insertions.
- b) The head bolts may be detensioned if visual source range indication is available in the control room and direct communication is established between the control room and the refueling station.
- c) The head bolts may be detensioned if audible source range indication can be made operable within 8 hours of detensioning the head bolts.
- d) The head bolts must not be detensioned. Detensioning would involve a Mode change and Technical Specifications does not allow discretionary Mode changes unless required equipment for that Mode is operable.

Answer: d

Test Item:	361	
Lesson Plan:	ROT-4-09	
Objective No.:	B9	
Objective:	Discuss the operation of the Controlling Temperature Select Switch and the Auto/Manual Tave Select Switch, including inputs and outputs.	
Reference:	OP-501	
K/A:	016 000 A2.03	Non-Nuclear Instrumentation System Generic Interpretation of transmitted signal
Task:	0160101002	Monitor the non-nuclear instrumentation system.
Importance:	3.0/3.3	
Expected Time (min):	2.5	

Test Item #5 (SRO B)

Point Value (1.0)

The unit is operating at 100% power with all ICS stations in automatic. During a transfer of the RC flow plug in the "A" RPS cabinet, the operator on the MCB notes a prolonged rod insertion. Which **ONE** of the following is a probable cause of this event?

- a) The plug transfer has caused a re-ratio of feedwater due to the temporary loss of the "A" loop flow signal.
- b) The AUTO/MANUAL (Tave) transfer switch transferred to an alternate signal which deviated from the controlling signal.
- c) The loss of the RC flow signal generated a variable flow runback signal which reduced the ULD demand.
- d) The feedwater total flow circuit modified reactor demand based on the new RC flow signal.

Answer: b

Test Item:	389
Lesson Plan:	ROT-4-13
Objective No.:	B8
Objective:	<p>Given the associated procedure, discuss the following evolutions:</p> <p>J. Place ES Channel in a tripped condition - OP-507</p>
Reference:	OP-507
K/A:	<p>013 Engineered Safety Features Actuation System</p> <p>000 Generic</p> <p>A3.01 Input channels and logic</p>
Task:	<p>0130101004 Bypass Engineered Safety Features</p> <p>0130101009 Align the Engineered Safety Features Actuation System as required for various plant modes.</p> <p>0130401002 Place an Engineered Safety Features Actuation System channel in the tripped condition.</p>
Importance:	3.7/3.9
Expected Time (min):	4.0

During operation at full power, it is determined that the pressure transmitter feeding the RC1 channel of ES is inoperable due to calibration problems and that the channel must be placed in a tripped condition to comply with Technical Specifications. Which **ONE** of the following action statements below is correct for this condition?

- a) On the RC pressure test module for the affected channel, you should select the "TEST OPERATE" position. This will result in a trip of the HPI and LPI systems for that channel.
- b) On the RC pressure test module for the affected channel, you should select the "T2" position and adjust the setpoint until both the HPI and LPI systems trip for that channel.
- c) On the RB pressure test module for the affected channel, you should select the "TEST OPERATE" position. This will result in a trip of the HPI, LPI, and RBIC systems for that channel.
- d) On the RC pressure test module for the affected channel, you should select the "T2" position and adjust the setpoint until the HPI, LPI and RBIC systems trip for that channel.

Answer: a

Test Item:	038	
Lesson Plan:	ROT-4-91	
Objective No.:	F5	
Objective:	Discuss the procedure for transferring a vital instrument bus power supply.	
Reference:	OP-703	
K/A:	062 000 K4.10	AC Electrical Distribution System Generic Uninterruptable ac power sources
Task:	0620401001	Direct the transfer of a vital power supply
Importance:	3.1/3.5	
Expected Time (min):	2.0	

Test Item #7 (SRO B)

Point Value (1.0)

While the plant is in Mode 3, Inverter 3D trips off the line due to an internal electrical failure. Which **ONE** of the following statements describes the result of this failure?

- a) The VBXS will automatically swap to the alternate AC source.
- b) The bus will be de-energized for 7 to 10 seconds and then be automatically re-energized by the VBXS.
- c) The bus must be manually swapped to the alternate power source.
- d) The VBXS will lose control power and fail to transfer.

Answer: a

Test Item:	383	
Lesson Plan:	ROT-4-91	
Objective No.:	A1	
Objective:	Discuss the Technical Specifications associated with the Electrical Distribution system.	
Reference:	STS 3.8.2.1	
K/A:	062 000 System Generic #5	AC Electrical Distribution System Generic Knowledge of the Technical Specifications bases and definitions related to limiting condition for operations and safety limits.
Task:	3410103037	Apply STS directions for safety limits, safety system settings and LCOs.
Importance:	3.0/4.0	
Expected Time (min):	4.0	

The plant is at 3% power during a return to power following an outage. Due to problems with wiring, the B and D inverters have just been shutdown and will be out of service for 24 hours. The respective transfer switches are selected to the alternate sources. Which **ONE** of the following would be the correct course of action based on the above information?

- a) Restore the inverters within 8 hours or be in Hot Standby within the next 6 hours and in Cold Shutdown within the following 30 hours.
- b) Enter Technical Specifications and maintain the present power level until the inverters are returned to service.
- c) Enter Technical Specifications and continue power escalation.
- d) Technical Specification action 3.0.3 must be applied and the plant must be placed in Hot Standby within 6 hours.

Answer: b

Test Item:	033	
Lesson Plan:	ROT-4-54	
Objective No.:	B13	
Objective:	Describe the limits and precautions of OP-404.	
Reference:	OP-404, SP-422	
K/A:	005 000 A1.01	Residual Heat Removal System Generic Heatup/cooldown rates
Task:	0050101016 0050101008	Regulate Decay Heat flowrate Monitor the Decay Heat Removal System
Importance:	3.5/3.6	
Expected Time (min):	2.5	

The Decay Heat system is operating nearing the completion of a cooldown. The following readings were recorded on the cooldown surveillance:

	RCS Pressure (psig)	RCS Temperature (°F)
1300 hrs	105	110
1400 hrs	103	106
1500 hrs	100	105
1600 hrs	95	105

Which **ONE** of the following statements describes the correct actions to be taken based on the above data?

- a) The plotting of cooldown must be continued for one additional shift.
- b) The plotting of cooldown must be continued for an additional 2 hours.
- c) Plotting can be secured if no further cooldown is required and 3 consecutive readings of temperature agree within $\pm 2^{\circ}\text{F}$
- d) Plotting can be secured as long as RCS temperature does not vary by more than $\pm 1^{\circ}\text{F}$ per hour during the remainder of the cooldown.

Answer: c

Test Item:	381	
Lesson Plan:	ROT-4-54	
Objective No.:	B8	
Objective:	Describe the limitations on Decay Heat flow.	
Reference:	OP-404	
K/A:	005	Residual Heat Removal System
	000	Generic
	K4.02	Modes of operation
Task:	0050101010	Establish auxiliary spray flow.
Importance:	3.2/3.5	
Expected Time (min):	2.0	

Test Item #10 (SRO B)

Point Value (1.0)

Cooldown and depressurization of the RCS is in progress using the Decay Heat Removal system. DHP-1A is in operation and DH auxiliary spray is being provided to the pressurizer. Pressurizer heater banks A, B, and C are in AUTO; banks D and E are OFF. The following conditions exist:

RCS Pressure 90 psia
RCS Th 229°F
DH Flow . . . 3000 gpm

Which **ONE** of the following conditions would present a problem during operation in the above configuration?

- a) Non-condensable gases will not be removed from the pressurizer causing accumulation in the system and pressure control problems.
- b) Fluid stratification in the pressurizer surge line will occur due to the flow in the auxiliary spray line.
- c) Excessive pressurizer spray in combination with pressurizer heater operation will cause gases in the pressurizer to be driven into solution and deposited in the RCS loops.
- d) The flow alignment will increase the fluid stratification and possibly cause steam bubble formation in the RCS hot legs.

Answer: d

Test Item:	425	
Lesson Plan:	ROT-4-12	
Objective No.:	B11	
Objective:	<p>Given pertinent details from any of the following industry events reports, discuss its relevance to CR-3 operations:</p> <p>a. 1989 Shearon Harris RPS miscalibration (SOER 08-90)</p>	
Reference:	OP-204	
K/A:	<p>002 Reactor Coolant System</p> <p>000 Generic</p> <p>K5.10 Relationship between reactor power and RCS differential temperature</p>	
Task:	0150101001	Verify functional operation of the Nuclear Instrumentation system.
Importance:	3.6/4.1	
Expected Time (min):	5.0	

The initial power escalation following a refueling outage is being performed. The reactor power level is stabilized. The following indications are available to the operator at the control board:

NI-5	100%
NI-6	100%
NI-7	100%
NI-8	99%
Th Loop A	603.5°F
Th Loop B	603.5°F
Tc Loop A	553.5°F
Tc Loop B	553.0°F
RCS T _{ave}	578°F

Which **ONE** of the following describes the action required based on the information provided?

- a) Reduce power to < 75% and request immediate calibration of the excore nuclear instrumentation.
- b) Reduce power to \leq 75% and reduce the overpower trip setpoint to \leq 85% of rated thermal power within 4 hours.
- c) Immediately commence a plant shutdown and have the plant in Mode 3 within 1 hour.
- d) Immediately reduce power < 100% RTP and have the excore nuclear instruments calibrated, or, within 1 hour commence plant shutdown to Mode 3 to be completed within the next 6 hours.

Answer: c

Test Item:	134	
Lesson Plan:	ROT-4-69	
Objective No.:	G4	
Objective:	Describe the basic operation of the following control systems: c) Condensate Demineralizer Bypass Valves	
Reference:	OP-601	
K/A:	059 000 System Generic #7	Main Feedwater System Generic Ability to locate, explain, and apply all limits and precautions.
Task:	0570104002	Perform lineups of the condensate demineralizer system
Importance:	3.1/3.2	
Expected Time (min):	2.0	

Given the following conditions:

- The plant is at 100% power.
- An unexplained air system failure has caused the inlet valves to all 6 condensate demineralizers to fail closed.

Which **ONE** of the following statements describes the effect and reason for the effect the above conditions will have on Main Feedwater?

- a) Main Feedwater will not be affected. The Condensate pumps will automatically reduce flow allowing time for the bypass valves to be opened.
- b) Main Feedwater will not be affected. There are two bypass valves which will automatically open at 80 psid.
- c) Main Feedwater will be lost. The bypass valves can not be opened quickly enough with a differential pressure of 80 psi, and the Condensate Pumps will shutdown.
- d) Main Feedwater may be lost. The bypass valves must be opened by the Turbine Building Operator and condensate flow restored prior to a loss of the MFW Booster Pumps.

Answer b

Test Item:	395	
Lesson Plan:	ROT-3-18	
Objective No.:	1	
Objective:	Describe symptoms that can distinguish LOCAs from other transients.	
Reference:	TBD	
K/A:	002	Pressurizer Pressure control System
	000	Generic
	A2.01	Heater failures
	A2.02	Spray valve failures
Task:	0000501001	Analyze indications to determine that an emergency/abnormal plant event is in progress
	0000501003	Analyze events to determine the cause of abnormal/emergency events
Importance:	4.3/4.4	
	4.2/4.4	
Expected Time (min):	3.0	

After receiving the RCS low pressure alarm, the nuclear operator scans the control board indicators and observes the following:

RCS Tave	579°F
RCS pressure	2100 psig and ↓ at 100 psig/min
PZR temperature . .	643°F and ↓ at 6°F/min
PZR level	constant
Makeup flow	8 to 10 gpm higher than normal
RCPs running . . .	4
RB pressure	normal and constant
Reactor power . . .	40%
RCP seal injection	normal

Which **ONE** of the following describes the developing scenario based on the provided data?

- a) Loss of all pressurizer heaters
- b) Stuck open pressurizer spray valve
- c) Pressurizer steam space leak
- d) Letdown line leak

Answer: c

Test Item:	258	
Lesson Plan:	ROT-5-01	
Objective No.:	B10	
Objective:	Given any plant condition and a copy of Technical Specifications, identify those conditions which are violations of a limiting condition for operation and discuss the required corrective actions.	
Reference:	SP-321, STS 3.0.3, STS 3.8.1.1b, STS 4.8.1.1.1a	
K/A:	062 AC Distribution System 000 Generic System Knowledge of the Technical Specifications Generic #5 bases and definitions related to limiting conditions for operation and safety limits. K1.04 Off-site power sources	
Task:	1190301015	Apply Technical Specification requirements
Importance:	3.1/3.8 3.7/4.2	
Expected Time (min):	4.5	

Test item: #7 (RO A)

Point Value (1.0)

You have been instructed to load the "A" EDG. Based on current plant conditions, which **ONE** of the following statements describes the result of this loading assuming the speed droop setting is left in the ES standby position? (Assume the operator takes no action other than closing the EDG output breaker.)

- a) Breaker 3211 will automatically open when the EDG reaches overload conditions.
- b) The EDG output breaker will automatically open due to an overcurrent condition.
- c) Breaker 3211 will automatically open due to an overcurrent condition.
- d) The EDG output breaker will automatically open and the engine will trip due to a reverse power condition.

Answer: a

Test Item:	SSE-02/15
Lesson Plan:	ROT-4-12
Objective No.:	B3 (H)
Objective:	Describe the location and/or operation of the following components: H. Reactor Trip Module
Reference:	
K/A:	012 Reactor Protection System 000 Generic A3.07 Trip breakers
Task:	0120101005 Monitor the Reactor Protection System.
Importance:	4.0/4.0
Expected Time (min):	2.25

Test item: #8 (RO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following statements describe what is indicated by the RED "Reactor Trip" light inside the "C" RPS channel on the 880 Trip module being bright?

- a) "C" RPS Channel is tripped
- b) Three RPS channels are tripped
- c) "C" CRDM breaker is open OR the "E" Electronic Trip has actuated
- d) "C" CRDM breaker is open AND the "E" Electronic Trip has actuated

Answer: d

Test Item:	SSE-02/16
Lesson Plan:	ROT-4-28
Objective No.:	B17(a)
Objective:	Discuss the indications and the effects of the following lamps on the Diamond Control Panel: a. Trip Confirm
Reference:	
K/A:	001 Control Rod Drive 000 Generic K6.03 Reactor trip breakers including controls
Task:	0010101009 Monitor the Control Rod Drive System
Importance:	3.7/4.2
Expected Time (min):	1.5

Test item: #9 (RO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following statements correctly describes the condition that is causing the TRIP CONFIRM lamp on the CRDM control panel to be "ON"?

- a) Three RPS channels are tripped.
- b) Rx Trip Lockout is tripped.
- c) All control rods (groups 1 through 7) are fully inserted.
- d) All CRDM breakers (A, B, C, D) are open and both Electronic Trips (E, F) are present.

Answer: d

Test Item:	SSE-02/new
Lesson Plan:	ROT-4-06
Objective No.:	B2
Objective:	Describe the location/function of the controls and indications available for the diesel generators.
Reference:	
K/A:	<div>064 Emergency Diesel Generator System</div> <div>000 Generic</div> <div>A3.03 Indicating lights, meters, and recorders</div>
Task:	<div>0640101004 Monitor the Emergency Diesel Generator</div> <div>0640101002 Start an Emergency Diesel Generator</div>
Importance:	3.4/3.4
Expected Time (min):	1.5

Test item: #10 (RO A)

Point Value (1.0)

Based on current plant conditions, if breaker 3209 were closed, which **ONE** of the following 4160V ES bus "B" feeder breakers would be blocked by the cross-tie blocking logic?

- a) 3206
- b) 3208
- c) 3210
- d) 3212

Answer: c

Test Item:	SSE-02/18	
Lesson Plan:	ROT-4-10	
Objective No.:	B3	
Objective:	From memory, list all protective interlocks and control features associated with the NIS.	
Reference:	OP-210	
K/A:	015 000 K4.01	Nuclear Instrumentation System Generic Source Range detector power shutoff at high powers
Task:	0150101001	Verify function operation of the Nuclear Instrumentation System
Importance:	3.1/3.5	
Expected Time (min):	3.0	

Test item: #11 (RO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the following statements correctly describes the minimum conditions necessary for source range NIs (NI-1, NI-2) to re-energize?

- a) Both NI-3 and NI-4 will have to drop to $\leq 1 \times 10^{-9}$ amps
- b) Both NI-3 and NI-4 will have to drop to $\leq 5 \times 10^{-10}$ amps
- c) Only NI-3 or NI-4 will have to drop to $\leq 1 \times 10^{-9}$ amps
- d) Only NI-3 or NI-4 will have to drop to $\leq 5 \times 10^{-10}$ amps

Answer: d

Test Item:	SSE-02/08
Lesson Plan:	ROT-4-60
Objective No.:	B3
Objective:	Describe the alarms, indications, control functions, and protective functions associated with RCS pressure.
Reference:	OP-204
K/A:	<div>010 Pressurizer Pressure Control System</div> <div>000 Generic</div> <div>A4.02 PZR heaters</div>
Task:	0100101004 Monitor the RCS Pressure Control System
Importance:	3.6/3.4
Expected Time (min):	1.5

Test item: #12 (RO A)

Point Value (1.0)

Based on current plant conditions, if RCS pressure is decreased to 2000 psig, which **ONE** of the following statements correctly describes the response of the PZR heaters?

- a) All PZR heaters will energize automatically.
- b) Only banks D and E will energize automatically.
- c) All PZR heaters will remain de-energized until RC-3-PIC PZR Heater Control Hand/Auto station demand is increased.
- d) Only banks D and E will energize if RC-3-PIC PZR Heater Control Hand/Auto station demand is increased.

Answer: b

Test Item:	SSE-02/20	
Lesson Plan:	ROT-4-15	
Objective No.:	B18	
Objective:	Describe the interlocks that exist in the EFIC System, and between the EFIC System and the RPS with regard to the channel maintenance bypass function.	
Reference:	AR-403	
K/A:	061 Auxiliary/Emergency Feedwater System 000 Generic System Knowledge of operator responsibilities Generic #1 during maintenance, tests, and surveillance activities	
Task:	0610101042	Monitor the Emergency Feedwater System
Importance:	3.7/4.0	
Expected Time (min):	1.5	

Test item: #13 (RO A)

Point Value (1.0)

Based on current plant conditions, which **ONE** of the EFIC channels could be placed into "Maintenance Bypass" at this time?

- a) EFIC channel "A"
- b) EFIC channel "B"
- c) EFIC channel "C"
- d) EFIC channel "D"

Answer: a

Questions 14 through 18 are GENERIC questions.

DO NOT base your answers on the static freeze point.

Test Item:	SSE-G031	
Lesson Plan:	ROT-4-63	
Objective No.:	B1	
Objective:	<p>DESCRIBE THE LOCATION AND/OR OPERATION OF THE FOLLOWING SYSTEM INSTRUMENTATION:</p> <p>A. RM-A1, Reactor Building Purge Duct Monitor</p>	
Reference:		
K/A:	<p>029 Containment Purge System</p> <p>000 Generic</p> <p>K4.03 Automatic purge isolation</p>	
Task:	0880401006	Verify proper operation of the plant ventilation system following high radiation in the reactor building.
Importance:	3.2/3.5	
Expected Time (min):	2.0	

Which **ONE** of the following describes the expected response when RM-A1 actuates during shutdown operations (Mode 5)?

- a) Purge supply fans will continue to run and the exhaust fans will stop, and purge supply and the exhaust valves will remain open.
- b) Purge supply and exhaust fans will stop and purge supply and the exhaust valves will close.
- c) Purge supply fans will stop and the exhaust fans will continue to run, and purge supply and the exhaust valves will remain open.
- d) Purge supply and exhaust fans will continue to run and the supply and exhaust valves will close.

ANSWER: d

Test Item:	SSE-G084	
Lesson Plan:	ROT-4-15	
Objective No.:	B18	
Objective:	Describe the interlocks that exist in the EFIC system, and between the EFIC system and the RPS with regard to the channel maintenance bypass function.	
Reference:		
K/A:	061 Auxiliary/Emergency Feedwater System 000 Generic System Knowledge of system purpose and/or Generic #4 function	
Task:	0190101001	Monitor the EFIC system
Importance:	4.0/4.0	
Expected Time (min):	4.0	

Test item: #15 (RO A)

Point Value (1.0)

When the RPS is placed in shutdown bypass, which **ONE** of the following statements describes the interlock that exists between the RPS and EFIC systems.

- a) Only the "OTSG Low Level" interlock is bypassed.
- b) Only the EFIC "Both Main Feed Pumps Tripped" interlock is bypassed.
- c) Both the "OTSG Low Pressure" and "OTSG Low Level" interlocks are bypassed.
- d) Both the "OTSG Low Pressure" and "Both Main Feed Pumps Tripped" interlocks are bypassed.

Answer: b

Test Item:	SSE-G033
Lesson Plan:	ROT-4-07
Objective No.:	G13
Objective:	Describe the Halon System including the following items at a minimum: A. Number of cylinders. B. Number of banks. C. Type of halon used. D. Number of detectors needed to actuate the system.
Reference:	
K/A:	086 Fire Protection System 000 Generic K4.05 Halon
Task:	0860104003 Monitor the fire protection system 0860204007 Perform SP-363, Fire Protection System tests
Importance:	3.0/3.4
Expected Time (min):	2.0

Test item: #16 (RO A)

Point Value (1.0)

Which **ONE** of the following describes the minimum required to actuate the Halon Fire Suppression System in the Cable Spreading room?

- a) An alarm from any two detectors in the same zone.
- b) An alarm from one detector in either zone.
- c) An alarm from one detector in each zone.
- d) An alarm from two detectors from each zone.

ANSWER: c

Test Item:	SSE-G053
Lesson Plan:	ROT-2-05
Objective No.:	B2
Objective:	Sketch the RCS and steam temperature profiles for 0% to 100% power and explain the shape of the curves.
Reference:	
K/A:	<div>002 Reactor Coolant System</div> <div>000 Generic</div> <div>K5.15 Relationships between effects in the primary coolant system and the secondary coolant system</div>
Task:	10 CFR 55
Importance:	4.0/4.2
Expected Time (min):	3.5

Which **ONE** of the following statements describes the effect on the primary system parameters as power is increased in the 0 → 15% power range with the Turbine Header Pressure controller incorrectly set to control at 850 psig?

- a) Initial Tc would be the same. RCS ΔT would be increased for a given power level. A lower power would be required to reach a Tave of 579°F.
- b) Initial Tc would be the same. RCS ΔT would remain the same for a given power level. The higher power would be required to reach a Tave of 579°F.
- c) Initial Tc would be lower. RCS ΔT would be increased for a given power level. A lower power would be required to reach a Tave of 579°F.
- d) Initial Tc would be lower. RCS ΔT would remain the same for a given power. A higher power would be required to reach a Tave of 579°F.

ANSWER: d

Test Item:	SSE-G047
Lesson Plan:	ROT-4-56
Objective No.:	B3
Objective:	State the controls, interlocks, function, location, and power supply of the following: a. SW Pumps (SWP-1A/1B/1C)
Reference:	
K/A:	<div>008 Component Cooling Water System</div> <div>000 Generic</div> <div>K4.01 Automatic start of standby pump</div>
Task:	<div>0080101004 Start the SW system</div> <div>0080101006 Operate the nuclear services booster pumps</div> <div>0080101009 Monitor the SW system</div>
Importance:	3.1/3.3
Expected Time (min):	2.0

Test item: #18 (RO A)

Point Value (1.0)

Which **ONE** of the following describes how the SW pump will respond when a loss of offsite power occurs coincident with HPI actuation?

- a) The pumps will be prevented from auto start until all ES equipment has loaded on to the bus.
- b) As soon as power is restored the SW pumps (1A/1B) will automatically start due to the low pressure condition.
- c) The automatic start on low pressure will be prevented, but the pumps will auto start when block loaded by the ES system.
- d) The operator will have a permissive to restart either SWP-1A or SWP-1B, but the automatic start will be totally blocked.

ANSWER: c

ATTACHMENT 3

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ANSWER KEY COVER SHEET

TRAINING PROGRAM TITLE: LICENSED OPERATOR REQUALIFICATION

EXAMINATION TITLE: LICENSED OPERATOR REQUALIFICATION - CATEGORY B

EXAMINATION NAME OR NUMBER: 1992 CATEGORY B RO EXAM

PREPARER:

Ronnie L. Byrd

DATE: 11-10-1992

APPROVAL:

Johnnie Smith
Nuclear Training Supervisor

DATE: 11-10-92

INSTRUCTIONS FOR TAKING THE EXAMINATION

1. Use black ink or dark pencil only to ensure legible copies.
2. Ensure your name is printed in the blank provided on the cover sheet of the examination and the answer sheet.
3. Each question has only **ONE** correct answer. Mark your answers on the answer sheet provided and do not leave any question blank. If additional paper is required, use only the lined paper provided by the examiner.
4. All questions are worth 1.0 point.
5. If parts of the examination are not clear with respect to their intent, ask questions of the examiner only.
6. The examination is designed to take approximately 90 minutes to complete. You will be given **2 HOURS** to complete the examination.
7. The questions have been time validated by knowledgeable persons. You should be aware that not every answer needs to be verified by consulting a reference and excessive usage of reference material may cause you to not complete the examination in the allotted time.
8. Restroom trips are limited and only one examinee at a time may leave. You must avoid all contact with anyone outside the examination room to avoid even the appearance or possibility of examination compromise.
9. Cheating on the examination could result in revocation of your license and may result in more severe penalties.
10. You must sign the statement on the cover sheet that indicates the work on the examination is your own and that you have not received or been given any assistance in completing the examination. This must be signed **AFTER** the examination has been completed.
11. When you are finished and have turned in your completed examination, leave the examination area.

Test Item:	133	
Lesson Plan:	ROT-5-36	
Objective No.:	B3	
Objective:	Given EM-204A and the required data, be able to complete a dose assessment.	
Reference:	EM-204A	
K/A:	000 Emergency Plant Evolutions 038 Steam Generator Tube Rupture System Generic #2 Knowledge of system status criteria which require the notification of plant supervisors or off-plant personnel.	
Task:	1150501001	Estimate off-site dose during a radiological release using EM-204(A).
Importance:	3.0/3.9	
Expected Time (min):	4.5	

Test Item #1 (RO B)

Point Value (1.0)

A steam generator tube rupture has occurred. There is a release in progress through the condenser exhaust line. The plant has been placed in a stable condition and an off-site initial dose assessment is to be completed. The following data is provided:

- Avg. Wind Direction 315°
- Wind Range 50°
- Wind Speed 3 m/sec
- Delta-T -1.2°F

Which **ONE** of the following is the weather condition "Stability Class"?

- a) Stability Class "B"
- b) Stability Class "C"
- c) Stability Class "D"
- d) Stability Class "F,G"

Answer:

e/ b

RCB
11/16/92

Test Item:	036
Lesson Plan:	ROT-5-62
Objective No.:	2
Objective:	Given a copy of the Abnormal Procedure be able to state a basic reason for any given Symptom or Follow up action.
Reference:	AP-360
K/A:	000 Emergency Plant Evolutions 025 Loss of Residual Heat Removal System EK3.01 Shift to alternate flow path
Task:	0050401001 Perform the required actions for a loss of decay heat removal.
Importance:	3.1/3.4
Expected Time (min):	4.0

Test Item #2 (RO B)

Point Value (1.0)

Given the following conditions:

- A loss of both Decay Heat removal pumps has occurred
- RCS pressure is 125 psig
- RCS temperature is 130°F
- Both OTSGs are available
- The RCS is completely filled and PZR level is 60 inches

Which **ONE** of the following alternate cooling methods should the operator use?

- a) OTSG cooling
- b) Spent Fuel cooling
- c) HPI cooling
- d) BWST drain through LPI to vessel

Answer: a

Test Item:	374	
Lesson Plan:	ROT-5-64	
Objective No.:	B3	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given Symptom, Immediate or Follow-up action.	
Reference:	AP-450	
K/A:	059 000 K1.03	Main Feedwater System Generic Steam Generators
Task:	0000501.006	Perform the actions to ensure that core cooling and subcooling margin are maintained during an emergency event.
Importance:	3.1/3.3	
Expected Time (min):	2.5	

Test Item #3 (RO B)

Point Value (1.0)

Following a loss of the Unit 4160 VAC and 6900 VAC buses due to a fire, Emergency Feedwater is lost. The decision is made to use Main Feedwater to feed the OTSGs. The following plant conditions exist:

- ☐ Level in both OTSGs = 12 inches
- ☐ Pressure in both OTSGs = 800 psig
- ☐ RCS temperature = 525°F
- ☐ Feedwater temperature = 135°F
- ☐ "A" Unit 4160 VAC Bus energized
(other unit buses are de-energized)
- ☐ "A" MFP operating in recirculation

Which **ONE** of the following would be the correct method for feeding the OTSGs?

- a) Feed OTSGs through the high nozzles at ~ 1000 gpm/OTSG
- b) Feed OTSGs through the lower nozzles at ~ 1000 gpm/OTSG
- c) Feed OTSGs through the high nozzles at ~ 1500 gpm/OTSG
- d) Feed OTSGs through the lower nozzles at ~ 500 gpm/OTSG

Answer: a

Test Item:	361	
Lesson Plan:	ROT-4-09	
Objective No.:	B9	
Objective:	Discuss the operation of the Controlling Temperature Select Switch and the Auto/Manual Tave Select Switch, including inputs and outputs.	
Reference:	OP-501	
K/A:	016 000 A2.03	Non-Nuclear Instrumentation System Generic Interpretation of transmitted signal
Task:	0160101002	Monitor the non-nuclear instrumentation system.
Importance:	3.0/3.3	
Expected Time (min):	2.5	

Test Item #4 (RO B)

Point Value (1.0)

The unit is operating at 100% power with all ICS stations in automatic. During a transfer of the RC flow plug in the "A" RPS cabinet, the operator on the MCB notes a prolonged rod insertion. Which **ONE** of the following is a probable cause of this event?

- a) The plug transfer has caused a re-ratio of feedwater due to the temporary loss of the "A" loop flow signal.
- b) The AUTO/MANUAL (Tave) transfer switch transferred to an alternate signal which deviated from the controlling signal.
- c) The loss of the RC flow signal generated a variable flow runback signal which reduced the ULD demand.
- d) The feedwater total flow circuit modified reactor demand based on the new RC flow signal.

Answer: b

Test Item:	389
Lesson Plan:	ROT-4-13
Objective No.:	B8
Objective:	<p>Given the associated procedure, discuss the following evolutions:</p> <p>J. Place ES Channel in a tripped condition - OP-507</p>
Reference:	OP-507
K/A:	<p>013 Engineered Safety Features Actuation System</p> <p>000 Generic</p> <p>A3.01 Input channels and logic</p>
Task:	<p>0130101004 Bypass Engineered Safety Features</p> <p>0130101009 Align the Engineered Safety Features Actuation System as required for various plant modes.</p> <p>0130401002 Place an Engineered Safety Features Actuation System channel in the tripped condition.</p>
Importance:	3.7/3.9
Expected Time (min):	4.0

During operation at full power, it is determined that the pressure transmitter feeding the RC1 channel of ES is inoperable due to calibration problems and that the channel must be placed in a tripped condition to comply with Technical Specifications. Which **ONE** of the following action statements below is correct for this condition?

- a) On the RC pressure test module for the affected channel, you should select the "TEST OPERATE" position. This will result in a trip of the HPI and LPI systems for that channel.
- b) On the RC pressure test module for the affected channel, you should select the "T2" position and adjust the setpoint until both the HPI and LPI systems trip for that channel.
- c) On the RB pressure test module for the affected channel, you should select the "TEST OPERATE" position. This will result in a trip of the HPI, LPI, and RBIC systems for that channel.
- d) On the RC pressure test module for the affected channel, you should select the "T2" position and adjust the setpoint until the HPI, LPI and RBIC systems trip for that channel.

Answer: a

Test Item:	038	
Lesson Plan:	ROT-4-91	
Objective No.:	F5	
Objective:	Discuss the procedure for transferring a vital instrument bus power supply.	
Reference:	OP-703	
K/A:	062	AC Electrical Distribution System
	000	Generic
	K4.10	Uninterruptable ac power sources
Task:	0620401001	Direct the transfer of a vital power supply
Importance:	3.1/3.5	
Expected Time (min):	2.0	

While the plant is in Mode 3, Inverter 3D trips off the line due to an internal electrical failure. Which **ONE** of the following statements describes the result of this failure?

- a) The VBXS will automatically swap to the alternate AC source.
- b) The bus will be de-energized for 7 to 10 seconds and then be automatically re-energized by the VBXS.
- c) The bus must be manually swapped to the alternate power source.
- d) The VBXS will lose control power and fail to transfer.

Answer: a

Test Item:	033	
Lesson Plan:	ROT-4-54	
Objective No.:	B13	
Objective:	Describe the limits and precautions of OP-404.	
Reference:	OP-404, SP-422	
K/A:	005 000 A1.01	Residual Heat Removal System Generic Heatup/cooldown rates
Task:	0050101016 0050101008	Regulate Decay Heat flowrate Monitor the Decay Heat Removal System
Importance:	3.5/3.6	
Expected Time (min):	2.5	

The Decay Heat system is operating nearing the completion of a cooldown. The following readings were recorded on the cooldown surveillance:

	RCS Pressure (psig)	RCS Temperature (°F)
1300 hrs	105	110
1400 hrs	103	106
1500 hrs	100	105
1600 hrs	95	105

Which **ONE** of the following statements describes the correct actions to be taken based on the above data?

- a) The plotting of cooldown must be continued for one additional shift.
- b) The plotting of cooldown must be continued for an additional 2 hours.
- c) Plotting can be secured if no further cooldown is required and 3 consecutive readings of temperature agree within $\pm 2^{\circ}\text{F}$
- d) Plotting can be secured as long as RCS temperature does not vary by more than $\pm 1^{\circ}\text{F}$ per hour during the remainder of the cooldown.

Answer: c

Test Item:	381	
Lesson Plan:	ROT-4-54	
Objective No.:	B8	
Objective:	Describe the limitations on Decay Heat flow.	
Reference:	OP-404	
K/A:	005	Residual Heat Removal System
	000	Generic
	K4.02	Modes of operation
Task:	0050101010	Establish auxiliary spray flow
Importance:	3.2/3.5	
Expected Time (min):	2.0	

Test Item #8 (RO B)

Point Value (1.0)

Cooldown and depressurization of the RCS is in progress using the Decay Heat Removal system. DHP-1A is in operation and DH auxiliary spray is being provided to the pressurizer. Pressurizer heater banks A, B, and C are in AUTO; banks D and E are OFF. The following conditions exist:

RCS Pressure 90 psia
RCS Th 229°F
DH Flow . . . 3000 gpm

Which **ONE** of the following conditions would present a problem during operation in the above configuration?

- a) Non-condensable gases will not be removed from the pressurizer causing accumulation in the system and pressure control problems.
- b) Fluid stratification in the pressurizer surge line will occur due to the flow in the auxiliary spray line.
- c) Excessive pressurizer spray in combination with pressurizer heater operation will cause gases in the pressurizer to be driven into solution and deposited in the RCS loops.
- d) The flow alignment will increase the fluid stratification and possibly cause steam bubble formation in the RCS hot legs.

Answer: d

Test Item:	134	
Lesson Plan:	ROT-4-69	
Objective No.:	G4	
Objective:	Describe the basic operation of the following control systems: c) Condensate Demineralizer Bypass Valves	
Reference:	OP-601	
K/A:	059 000 System Generic #7	Main Feedwater System Generic Ability to locate, explain, and apply all limits and precautions.
Task:	0570104002	Perform lineups of the condensate demineralizer system
Importance:	3.1/3.2	
Expected Time (min):	2.0	

Test Item #9 (RO B)

Point Value (1.0)

Given the following conditions:

- The plant is at 100% power.
- An unexplained air system failure has caused the inlet valves to all 6 condensate demineralizers to fail closed.

Which **ONE** of the following statements describes the effect and reason for the effect the above conditions will have on Main Feedwater?

- a) Main Feedwater will not be affected. The Condensate pumps will automatically reduce flow allowing time for the bypass valves to be opened.
- b) Main Feedwater will not be affected. There are two bypass valves which will automatically open at 80 psid.
- c) Main Feedwater will be lost. The bypass valves can not be opened quickly enough with a differential pressure of 80 psi, and the Condensate Pumps will shutdown.
- d) Main Feedwater may be lost. The bypass valves must be opened by the Turbine Building Operator and condensate flow restored prior to a loss of the MFW Booster Pumps.

Answer b

Test Item:	395	
Lesson Plan:	ROT-3-18	
Objective No.:	1	
Objective:	Describe symptoms that can distinguish LOCAs from other transients.	
Reference:	TBD	
K/A:	002 Pressurizer Pressure control System 000 Generic A2.01 Heater failures A2.02 Spray valve failures	
Task:	0000501001 0000501003 0000501005	Analyze indications to determine that an emergency/abnormal plant event is in progress Analyze events to determine the cause of abnormal/emergency events Determine if indications of fuel damage are present
Importance:	4.3/4.4 4.2/4.4	
Expected Time (min):	3.0	

After receiving the RCS low pressure alarm, the nuclear operator scans the control board indicators and observes the following:

RCS Tave	579°F
RCS pressure	2100 psig and ↓ at 100 psig/min
PZR temperature . .	643°F and ↓ at 6°F/min
PZR level	constant
Makeup flow	8 to 10 gpm higher than normal
RCPs running . . .	4
RB pressure	normal and constant
Reactor power . . .	40%
RCP seal injection	normal

Which **ONE** of the following describes the developing scenario based on the provided data?

- a) Loss of all pressurizer heaters
- b) Stuck open pressurizer spray valve
- c) Pressurizer steam space leak
- d) Letdown line leak

Answer: c

Test Item:	377	
Lesson Plan:	ROT-1-47	
Objective No.:	B3	
Objective:	Explain how and why changes in the moderator affect core reactivity.	
Reference:	OP-103C	
K/A:	001	Control Rod Drive System
	000	Generic
	K5.26	Definition of moderator temperature coefficient : application to reactor control
Task:	10CFR55	
Importance:	3.3/3.6	
Expected Time (min):	2.0	

A reactor startup is in progress and the nuclear operator has just announced that the reactor is critical. At this point an adjustment is made to the feedwater flow to both OTSGs which inadvertently causes a slight overfeeding such that T_{ave} decreases from 532°F to 525°F . Assuming middle of life conditions, RCS boron concentration is 800 ppm, and no automatic or operator action occurs, which **ONE** of the following describes the response of the reactor to this event?

- a) Reactor power will increase to and stabilize at $\approx 5 \times 10^{-7}$ amps on the intermediate range.
- b) The reactor will be subcritical and power will decrease to the point of steady state subcritical multiplication.
- c) Reactor power will increase and stabilize at $\approx 9\%$ full power.
- d) Because criticality is achieved below the point of adding heat, reactor power will not be affected by the temperature change.

Answer: a

Test Item:	241	
Lesson Plan:	ROT-4-03	
Objective No.:	B1	
Objective:	State the purpose of and the breakers associated with cross-tie blocking.	
Reference:	AR-702	
K/A:	062 000 K1.02	AC Electrical Distribution Generic Emergency Diesel Generator
Task:	0620101001 0620101004	Lineup the electrical distribution system Monitor the AC Electrical Distribution System
Importance:	4.1/4.4	
Expected Time (min):	2.0	

Which **ONE** of the following is a condition which will cause the "Diesel Gen B Parallel Block Act" light to be illuminated if the "A" DG Breaker is closed?

- a) Offsite Transformer is closed in to both ES buses.
- b) The Feeder to "A" 4160 ES bus from the Unit 3 Aux Transformer is closed with the Feeder to "B" 4160 ES bus from the Unit 3 S/U Transformer closed.
- c) The Feeder to "A" 4160 ES bus from the Offsite Transformer is closed with the Feeder to "B" 4160 ES bus from the Unit 3 S/U Transformer closed.
- d) The Feeder to "A" 4160 ES bus from the Unit 3 Aux Transformer is closed with the Feeder to "B" 4160 ES bus from the Offsite Transformer closed.

Answer: a

Test Item:	392
Lesson Plan:	ROT-5-43
Objective No.:	B2 & B4
Objective:	<p>List from memory the federal quarterly whole body dose limit for radiation workers, non-radiation workers and persons under 18 years of age.</p> <p>Demonstrate the use of the formula 5(N-18) to determine an individual's exposure limits.</p>
Reference:	HPP-300
K/A:	<p>Plant-Wide Generic #15</p> <p>Knowledge of 10 CFR 20 and related facility radiation control requirements</p>
Task:	<p>1190301010</p> <p>Apply radiation and contamination safety procedure</p>
Importance:	3.4/3.9
Expected Time (min):	4.0

Test Item #13 (RO B)

Point Value (1.0)

A dose limit extension has been granted for a radiation worker at CR3 who has the following completed Whole Body dose history:

(NRC FORM FOUR)

AGE: 20 years old as of 6-6-91
ACCUMULATED DOSE: 9 Rem as of 12-31-91
No dose for current quarter
(assume today is 1-1-92)

Which **ONE** of the following is the maximum whole body exposure which this person could receive in the current quarter and not exceed the federal whole body dose limits?

- a. 1.0 Rem
- b. 1.25 Rem
- c. 2.5 Rem
- d. 3.0 Rem

Answer: b

Test Item:	328	
Lesson Plan:	ROT-5-16	
Objective No.:	3	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given Symptom, Immediate or Follow-up action.	
Reference:	EP-140	
K/A:	000 024 EA2.06	Emergency Plant Evolutions Emergency Boration When boration dilution is taking place
Task:	0000501018	Perform required actions for Emergency Reactivity Control
Importance:	3.6/3.7	
Expected Time (min):	2.0	

Test Item #14 (RO B)

Point Value (1.0)

Which **ONE** of the following is the reason DW to the RB is isolated if RCS pressure is < 140 psig while in EP-140 "Emergency Reactivity Control"?

- a) Reduces the possibility of dilution from abnormal evolutions.
- b) Reduces the possibility of over filling the RCS at low pressures and temperatures.
- c) Reduces the possibility of filling the RCDT with DW and allowing that water to be transferred to a feed source supply tank for the RCS.
- d) Reduces the possibility of DW interfering with the sampling process for true boron concentration determination.

Answer: a

Test Item:	385	
Lesson Plan:	ROT-5-20	
Objective No.:	2	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given Symptom, Immediate, or Follow-up action.	
Reference:	EP-390	
K/A:	000 037 EK3.07	Emergency Plant Evolutions Steam Generator Tube Leak Actions contained in EOP for S/G tube leak
Task:	0000501022 0020401001	Perform the required actions following a Steam Generator tube rupture. Perform actions required for excessive Reactor Coolant system leakage.
Importance:	4.2/4.4	
Expected Time (min):	1.75	

The plant is in a forced shutdown condition due to a steam generator tube leak. The leak is getting progressively worse and pressurizer level is becoming increasingly more difficult to maintain. EP-390, Steam Generator Tube Leak, provides guidance which directs the reactor to be tripped if pressurizer level cannot be maintained ≥ 100 " with HPI.

Which **ONE** of the following conditions would result due to the tripping of the reactor at this point?

- a) A loss of adequate RCS pressure control.
- b) The PZR insurge can cause the PZR cooldown limits to be exceeded.
- c) If an MSSV should lift and fail to reseal, site boundary dose rates could be exceeded.
- d) The reactor coolant system would become saturated.

Answer: d

Test Item:	307	
Lesson Plan:	ROT-5-25	
Objective No.:	3	
Objective:	Given a copy of the Abnormal Procedure be able to state a basic reason for any given Symptom, Immediate, or Follow-up action.	
Reference:	AP-530, AP-380	
K/A:	000 Emergency Plant Evolutions 009 Small Break LOCA EK1.01 Natural circulation and cooling,including reflux boiling	
Task:	0000501010	Perform the actions required following an Engineered Safeguards System Actuation.
Importance:	4.2/4.7	
Expected Time (min):	5.0	

Given the following sequence of events:

- While operating at 100% FP, a small break LOCA occurs.
- The reactor trips and HPI actuates.
- Upon loss of SCM the RCPs are tripped.
- EFIC initiates and feeds both OTSGs to 95% on EFIC High Range.
- The reactor has a maximum decay heat output.
- Natural circulation can not be verified.

Which **ONE** of the following should be done to enhance natural circulation?

- a) Lower RCS pressure.
- b) Bump RCPs.
- c) Throttle HPI flow.
- d) Vent pressurizer.

Answer: b

Test Item:	141	
Lesson Plan:	ROT-5-73	
Objective No.:	2	
Objective:	Given a copy of the Abnormal Procedure be able to state a basic reason for any given Symptom, Immediate, or Followup Action.	
Reference:	EP-220	
K/A:	TH 193010 K1.06	
Task:	0000501019	Perform required actions for Pressurized Thermal Shock conditions
Importance:	3.6/3.8	
Expected Time (min):	2.5	

Given the following conditions:

- An overcooling event has occurred due to a failed MSSV.
- An OTSG tube leak was created by the MSSV failure.
- A reactor trip resulted from the overcooling.
- Twenty minutes after the reactor trip the plant conditions are:

Tc..... 365°F

RCS pressure... 1650 psig

Which **ONE** of the following actions must be taken?

- a) Reduce RCS pressure so the plant returns to the PTS operating region and continue plant cooldown maintaining emergency cooldown rate limits.
- b) Reduce RCS pressure so the plant returns to the PTS operating region and perform a three hour soak.
- c) Reduce RCS pressure so the plant returns to the PTS operating region and continue plant cooldown maintaining allowable cooldown rate limits.
- d) Allow the RCS to heatup to 475°F so the plant returns to the PTS operating region and perform a three hour soak.

Answer: c

Test Item:	372	
Lesson Plan:	ROT-5-31	
Objective No.:	2	
Objective:	Given a copy of the Abnormal Procedure, be able to state a basic reason for any given Symptom, Immediate or Follow-up action.	
Reference:	AP-990	
K/A:	062 AC Electrical Distribution System 000 Generic A2.06 Keeping the safeguards buses electrically separate	
Task:	0000501002	Perform the required actions to ensure plant safety during an emergency/abnormal event
Importance:	3.4/3.9	
Expected Time (min):	2.0	

Step 3.7 of AP-990, Shutdown From Outside Control Room, directs the operator to "Ensure Bkrs 3207 and 3208 are open and DC control power is off." Which **ONE** of the following is the reason for this step?

- a) Ensure local manual control of breakers 3207 and 3208 is available following Control Room evacuation.
- b) Ensure an inadvertent ES bus overload condition will not be created due to closure of multiple source feeder breakers.
- c) Ensure a fire induced fault would not cause closure of breakers 3207 and 3208, paralleling the Auxiliary transformer with the Start-up transformer.
- d) Ensure ES buses are not supplied by unprotected source feeder breakers since relay protection of breakers 3207 and 3208 is lost when control is transferred from the Control Room.

Answer: c

Test Item:	413	
Lesson Plan:	ROT-5-36	
Objective No.:	B3	
Objective:	Given EM-204A and the required data, be able to complete a dose assessment.	
Reference:	EM-204A	
K/A:	000 Emergency Plant Evolutions 060 Accidental Gaseous-Waste Release EK3.03 Actions contained in the EOP for accidental gaseous-waste release	
Task:	1150501001	Estimate off-site dose during a radiological release using EM-204 (A)
Importance:	3.8/4.2	
Expected Time (min):	4.5	

A large break LOCA has occurred. The present plant conditions are as follows:

OTSGs	dry and filling
RCS Pressure	725 psia
Tincore	690°F
RB Pressure	15 psia
RM-A2 Low Range	off scale high
RM-A2 Mid Range	70 mR/hr
RM-A2 Iodine	1000 cpm

An off-site dose assessment must be completed. The meteorological stability class has been determined to be F,G. Which **ONE** of the following would be the dose rate at the site boundary based on the listed data?

- a) $2.0E+3$ mR/hr
- b) $2.6E+3$ mR/hr
- c) $7.9E+4$ mR/hr
- d) $1.1E+5$ mR/hr

Answer: d

Test Item:	390	
Lesson Plan:	ROT-5-38	
Objective No.:	B4	
Objective:	State the requirements for the "Operator at the Controls" to remain in the red-carpeted general area of the Control Center.	
Reference:	AI-500	
K/A:	Plant-Wide Generic #29	Ability to coordinate personnel activities inside the control room.
Task:	NTS	
Importance:	3.1/4.7	
Expected Time (min):	1.5	

While in mode 1, with another reactor operator and the assistant shift supervisor present in the control room, a plant transient occurs. The ANSS directs the other reactor operator to leave the control room to complete a task that has some urgency. The ANSS then goes to get MET tower data to complete EM-204A. You now notice that the NNI-X power supply light on the redundant instrument panel is off.

Which **ONE** of the following statements describes your administrative ability to leave the red carpeted area to check the status of this power supply?

- a. You cannot leave the area; at least one operator must be in the red carpeted area at all times while in mode 1.
- b. You can leave the area as long as you have SSCD permission.
- c. You cannot leave the area since an unobstructed view of the main control board cannot be maintained.
- d. You can leave the area; there are no obstructions between the NNI power supplies and the main control board.

Answer: c

Test Item:	368	
Lesson Plan:	ROT-5-78	
Objective No.:	B1	
Objective:	Apply limits and precautions from OP-301, including their basis.	
Reference:	OP-301	
K/A:	060 074 EK1.03	Emergency Plant Evolutions Inadequate Core Cooling Processes for removing decay heat from the core
Task:	0020101005 0020101009	Drain and nitrogen blanket the Reactor Coolant System. Monitor the Reactor Coolant System.
Importance:	4.5/4.9	
Expected Time (min):	4.5	

Given the following conditions:

- The reactor was shutdown at 0000 (midnight) on Dec. 2, 1990.
- Today is Dec. 8, 1990 and the time is 0800.
- The RCS has been depressurized in preparation for head removal.
- The vessel has been drained to a level just above the flange but not yet low enough for head removal.
- In preparation for refueling the incore instruments have been withdrawn from the core region.
- A total loss of Decay Heat Removal has occurred.
- Just prior to the loss of Decay Heat Removal RCS temperature was 70°F.

Which **ONE** of the following is the approximate time it is expected to take to reach 212°F (boiling) in the core?

- a) 22 minutes
- b) 27 minutes
- c) 35 minutes
- d) 39 minutes

Answer: d or C

Test Item:	351	
Lesson Plan:	ROT-5-81	
Objective No.:	B1	
Objective:	State the entry level conditions for this Abnormal Procedure.	
Reference:	AP-581	
K/A:	016 000 A2.02	Non-Nuclear Instrumentation System Generic Loss of power supply
Task:	0160401002	Perform required actions for a loss of power to the NNI system.
Importance:	2.9*/3.2*	
Expected Time (min):	1.5	

Which **ONE** of the statements below is correct concerning a loss of NNI-X?

- a) A failure of the NNI-X ABT output is considered a loss of NNI-X.
- b) Only components powered from VBDP-1, VBDP-3, and VBDP-5 will be affected by a loss of NNI-X.
- c) The interlock functions associated with MUV-49 are unaffected by a loss of NNI-X DC power.
- d) A loss of NNI-X DC power can be confirmed by the absence of any 1 of the 4 indicating lights located in NNI Cabinet 3.

Answer: a

Test Item:	014	
Lesson Plan:	ROT-4-14	
Objective No.:	B2	
Objective:	Describe the location and/or operation of the following system controls and interlocks: B. Integrated Master subsection including control stations.	
Reference:	AP-545, FSAR	
K/A:	059 000 K1.07	Main Feedwater System Generic ICS
Task:	0410101001 0410101005	Monitor the ICS system. Operate the ICS to affect plant power changes while operating with 3 RCPs.
Importance:	3.2/3.2	
Expected Time (min):	2.0	

The following sequence of events occur:

- The plant is at 85% FP and RCP-1C trips.
- The plant runs back to 75%.
- The narrow range Tc instrument is to be transferred from TT-1 to TT-3.
- A recommendation is made to place the "SG/Rx hand-auto station" into manual prior to transferring the narrow range Tc instrument.

Which **ONE** of the following statements is correct regarding the recommendation to place the "SG/Rx hand-auto station" into manual?

- a) Placing the "SG/Rx hand-auto" station to manual will place ICS in Track and block any effects of changing the Tc instrument.
- b) When the "SG/Rx hand-auto" station is in manual, variations in Tc will only affect the Tave correction circuit for the reactor demand.
- c) The "SG/Rx hand-auto" station is upstream of the Tc input to FW and Rx. This will not prevent Tc from changing feedwater or reactor power demand signals.
- d) Taking the "SG/Rx hand-auto" station to manual will place ICS in Track ensuring power level will not increase above 75% due to variations in the Tc input to ICS.

Answer: c

Test Item:	142
Lesson Plan:	ROT-4-14
Objective No.:	B9
Objective:	Discuss the system response and required operator action for the abnormal conditions listed below: D. Failure of ICS input signals or controlled devices
Reference:	FSAR
K/A:	000 Emergency Plant Evolutions 001 Continuous Rod Withdrawal EK1.14 Interaction of ICS control stations as well as purpose, function, and modes of operation of ICS
Task:	0160401001 Perform required actions for a malfunction of a Non-Nuclear instrumentation detector or channel. 0590401004 Perform required actions for reduction in Main FW flow at any power level, including a loss of 1 or both Main FW pumps.
Importance:	3.4/3.7
Expected Time (min):	3.0

The plant is operating at 75% FP with all ICS stations in Auto when the following sequence of events occurs:

- Suddenly the operator observes:
 - rods are receiving a continuous IN command
 - both F.W. demands are increasing
- "FW Limited by Reactor" annunciator alarms.
- The Rx demand H/A station, when placed in measured variable, shows a zero error (on the caret).
- The diamond panel is operating correctly.

Which **ONE** of the following malfunctions would cause the above sequence of events?

- a) The Feedwater to Reactor cross limiting circuit fails low.
- b) The actual neutron power signal going to the ICS fails high.
- c) The Reactor Demand input signal fails high.
- d) The Tave input signal fails low.

Answer: b

Test Item:	297	
Lesson Plan:	ROT-5-28	
Objective No.:	B1	
Objective:	State the entry level conditions for this Abnormal Procedure.	
Reference:	AP-580	
K/A:	000 Emergency Plant Evolutions 007 Reactor Trip System Generic #11 Ability to perform those actions, without reference to procedure, for all casualties which require immediate operation of system components or controls.	
Task:	0000501001	Analyze indications to determine that an emergency/abnormal plant event is in progress.
Importance:	4.1/4.3	
Expected Time (min):	3.0	

From the various conditions listed below, which **ONE** would cause an AUTOMATIC reactor trip?

- a) Th is 597°F and RCS pressure is 1820 psig
- b) Th is 588°F and RCS pressure is 1850 psig
- c) 3 RCPs operating, power 72%, imbalance -17%
- d) 4 RCPs operating, power 95%, imbalance -22%

Answer: a

Test Item:	168	
Lesson Plan:	ROT-5-19	
Objective No.:	3	
Objective:	Given a copy of the EP-290 state the operator actions required to accomplish each procedural step.	
Reference:	EP-290	
K/A:	000 Emergency Plant Evolutions 074 Inadequate Core Cooling EA1.04 Turbine bypass or atmospheric dump valves, to obtain and maintain the desired pressure	
Task:	0000501021 Perform required actions for Inadequate Core Cooling. 0000501005 Perform actions to ensure that core cooling and subcooling margin are maintained during an emergency event.	
Importance:	3.9/4.1	
Expected Time (min):	6.0	

A LOCA has occurred and primary plant parameters are:

- RCS pressure: 600 psig
- Incore Thermocouples: 975°F.

Which **ONE** of the following describes the OTSG pressure requirements for the above conditions?

- a) Atmospheric
- b) 25 to 50 psig below saturation pressure of the RCS
- c) 25 to 50 psig above saturation pressure of the RCS
- d) Equivalent to 100°F below RCS saturation temperature

Answer: a

Test Item:	386
Lesson Plan:	ROT-5-07
Objective No.:	B2 & B3
Objective:	<p>Discuss the acceptance criteria for the Surveillance Procedure and the actions to be taken if acceptance criteria is not met.</p> <p>Using the procedure, discuss or walk through the procedural steps of the Surveillance Procedure.</p>
Reference:	SP-312B, STS 3.3.1.1
K/A:	<p>012 Reactor Protection System</p> <p>000 Generic</p> <p>System Ability to recognize indications for system Generic #8 operating parameters which are entry level conditions for Technical Specifications.</p> <p>015 Nuclear Instrumentation System</p> <p>000 Generic</p> <p>A1.05 Imbalance (axial shape)</p>
Task:	0150201003 Perform a power imbalance calculation.
Importance:	3.7/4.3 3.7/3.9
Expected Time (min):	4.0

In preparation for the performance of SP-312B, Monthly NI Imbalance Comparison, the following data is observed on computer Group 59:

NI-5 Imbalance	-5.8%
NI-6 Imbalance	-3.9%
NI-7 Imbalance	-8.2%
NI-8 Imbalance	-5.1%
Incore Imbalance	-6.3%
Thermal Power	2350 MWth

Based on the above data, which **ONE** of the following is the recommended course of action?

- a) Notify I&C to perform SP-113, Power Range Nuclear Instrumentation Calibration, then repeat data gathering and performance of SP-312B.
- b) Reduce power to $< 75\%$, trip the inoperable RPS channel, and reset all high flux trip setpoints to $\leq 85\%$ within 4 hours.
- c) Trip the inoperable RPS channel within 1 hours and monitor core quadrant power tilt at least once every 12 hours.
- d) Take action within 1 hour to ensure a plant shutdown to Hot Standby is completed within the next 6 hours.

Answer: c

Test Item:	418	
Lesson Plan:	ROT-5-02	
Objective No.:	B1	
Objective:	<p>Given a limit and precaution from one of the following operating procedures, explain the basis.</p> <p>c. OP-203</p>	
Reference:	OP-203	
K/A:	<p>000 Emergency Plant Evolutions</p> <p>003 Dropped Control Rod</p> <p>EK1.03 Relationship of reactivity and reactor power to rod movement.</p>	
Task:	<p>0000501001 Analyze indications to determine that an emergency/abnormal plant event is in progress.</p> <p>0010101009 Monitor the Control Rod Drive system.</p>	
Importance:	3.5/3.8	
Expected Time (min):	2.5	

The reactor is at 10^{-7} amps on the Intermediate Range during a plant startup when control rod 5-6 drops to the fully inserted position. Control board instruments indicate the following:

NI-3 amps	decreasing
SUR	-0.3 dpm and steady
NI-4 amps	decreasing
SUR	-0.3 dpm and steady
T _{ave}	530°F and decreasing
RCS Pressure	2150 psig and decreasing

Which **ONE** of the following describes the proper course of action based on the data provided?

- a) Trip the reactor to ensure adequate shutdown margin and prevent inadvertent criticality.
- b) Fully insert all regulating rod groups and establish Mode 3.
- c) Maintain stable plant conditions at the present power level and recover the dropped rod in accordance with OP-502.
- d) Reduce power to 10^{-8} amps on the Intermediate Range and recover the dropped rod in accordance with OP-502.

Answer: b

Test Item:	420	
Lesson Plan:	ROT-5-02	
Objective No.:	B2	
Objective:	<p>Given a copy of one of the following operating procedures, explain the action completed in each step:</p> <p>a. OP-202</p>	
Reference:	OP-103F	
K/A:	<p>002 Reactor Coolant System</p> <p>020 Normal Operations</p> <p>K4.03 Contraction and expansion during heatup and cooldown.</p>	
Task:	0020101011	Heatup the Reactor Coolant System (with RCPs and the reactor).
Importance:	3.1/3.4	
Expected Time (min):	3.25	

The Reactor Coolant System is being heated up from 300°F to 532°F. Which **ONE** of the following describes the amount of water that must be accommodated by the Radwaste System due to the heatup of the Reactor Coolant System?

- a) 2,300 gal
- b) 2,500 gal
- c) 12,750 gal
- d) 15,500 gal

Answer: c

Test Item:	023	
Lesson Plan:	ROT-5-01	
Objective No.:	B10	
Objective:	Given any plant condition and a copy of Technical Specifications, identify those conditions which are violations of a limiting condition for operation and discuss the required corrective actions.	
Reference:	AP-545, STS 3.1.3.1	
K/A:	000 003 EK3.04	Emergency Plant Evolutions Dropped Control Rod Actions contained in EOP for dropped control rod
Task:	1190301015	Apply Technical Specification requirements.
Importance:	3.8/4.1	
Expected Time (min):	4.5	

While operating at 75% FP with 3 reactor coolant pumps operating. A control rod drops into the core. Assuming the control rod can not be recovered for 36 hours, which **ONE** of the following is the maximum power level at which operation may continue?

- a) 36%
- b) 45%
- c) 47%
- d) 60%

Answer: c

Test Item:	407	
Lesson Plan:	ROT-4-60	
Objective No.:	B5	
Objective:	Explain how to manually control PZR heaters and spray.	
Reference:	OP-305	
K/A:	010 000 K6.03	Pressurizer Pressure Control System Generic PZR sprays and heaters
Task:	0100101001	Control Reactor Coolant System pressure by manual control of pressurizer heaters and spray.
Importance:	3.2/3.6	
Expected Time (min):	5.0	

Test Item #31 (RO B)

Point Value (1.0)

The plant is being cooled down and the decision has been made to use the high pressure auxiliary spray line to the pressurizer. The valve line-up has been completed and spray has been initiated. The following indications are observed on the main control board:

Pressurizer level	.....	100"
Makeup flow	.....	60 gpm
Letdown flow	.....	110 gpm
Total seal injection flow	.....	74 gpm
RCP-1A seal injection flow	.....	8 gpm
RCP-1B seal injection flow	.....	10 gpm
RCP-1C seal injection flow	.....	7 gpm
RCP-1D seal injection flow	.....	9 gpm
HPI flow	.....	0 gpm (total)
Auxiliary spray flow	.....	0 gpm

Which **ONE** of the following would be the spray flow to the pressurizer from the Makeup system?

- a) 0 gpm
- b) 40 gpm
- c) 50 gpm
- d) 74 gpm

Answer: b