

November 9, 2000

Mr. Charles H. Cruse
Vice President
Calvert Cliffs Nuclear Power Plant, Inc.
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: CALVERT CLIFFS GENERATING STATION, UNITS 1 AND 2 REACTOR
OPERATOR AND SENIOR REACTOR OPERATOR INITIAL EXAMINATION
REPORT 05000317/2000-301 AND 05000318-301

Dear Mr. Cruse:

This report transmits the results of the subject operator licensing examinations conducted by the NRC during the period of September 25 - 29, 2000. These examinations addressed areas important to public health and safety and were developed and administered using the guidelines of the "Examination Standards for Power Reactors" (NUREG-1021, Revision 8).

Based on the results of the examinations, all twelve applicants (four instant Senior Reactor Operators (SRO), three SRO upgrades, and five Reactor Operators (RO)) passed all portions of the examinations. The preliminary performance insights observed during the examination were discussed between Mr. L. Briggs and Ms. N. Winters and others on September 29, 2000.

A subsequent inspection was conducted during the period of October 10 through 12, 2000, to determine whether an examination compromise had occurred during the development and preparation of the examination. The preliminary observations of the inspection were discussed with Mr. J. Lemons on September 12, 2000. The final results of the examination and the inspection were discussed via telephone conference call on October 19, 2000.

Based on this inspection it was determined that there was no evidence of an examination compromise; however, the NRC determined that there were four violations of NRC requirements. These violations are not being cited due to the very low safety significance (apparent no actual compromise and very low potential for compromise). Because the finding was entered into your corrective action system for resolution, the NRC is treating three of these issues (sections 40A4 b(1) through (2) and 40A7) as non-cited violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. The fourth issue (sections 40A4 b(3)) is considered a minor violation. If you deny these non-cited violations, you should provide a response with the bases for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region 1; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Calvert Cliffs facility.

Mr. Charles H. Cruse

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No reply to this letter is required, but should you have any questions regarding this examination/inspection, please contact me at 610-337-5183, or by E-mail at RJC@NRC.GOV.

Sincerely,

/RA/

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

Docket Nos. 05000317 and 05000318
License Nos. DPR-53 and DPR 69

Enclosure: Initial Examination Report No. 05000317/2000-301 and 05000318/2000-301
w/Attachments 1 and 2

Attachments:

1. SRO Written Exam w/Answer Key
2. RO Written Exam w/Answer Key

cc w/encl; w/Attachments 1-2:

J. Hornek, Supervisor - Initial Training

cc w/encl; w/o Attachment 1-2:

B. Montgomery, Director, Nuclear Regulatory Matters (CCNPP)
R. McLean, Administrator, Nuclear Evaluations
J. Walter, Engineering Division, Public Service Commission of Maryland
K. Burger, Esquire, Maryland People's Counsel
R. Ochs, Maryland Safe Energy Coalition
State of Maryland (2)

Mr. Charles H. Cruse

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Distribution w/encl; w/Attachments 1-2:

C. Buracker, DRS (Master Exam File)

Distribution w/encl; w/o Attachments 1-2:

Region I Docket Room (with concurrences)

L. Briggs, Chief Examiner, DRS

D. Beaulieu, SRI, Calvert Cliffs

C. Buracker, DRS (OL Facility File)

R. Conte, DRS

H. Miller, RA

J. Wiggins, DRA

J. Shea, RI EDO Coordinator

E. Adensam, NRR (ridsnrrdlpmlpdi)

A. Dromerick, NRR

D. Thatcher, NRR

J. Wilcox, NRR

W. Cook, DRP

R. Junod, DRP

M. Oprendeck, DRP

W. Lanning, DRS

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 05000317 and 05000318

Report Nos: 05000317/2000-301 and 05000318/2000-301

License Nos: DPR-53 and DPR 69

Licensee: Constellation Nuclear Energy Group

Facility: Calvert Cliffs, Units 1 and 2

Location: Lusby, Maryland

Dates: September 22 - 29, 2000 (Operating and Written Test Administration)
October 2 - 6 and October 13, 2000 (Grading)
October 10 - 12, 2000 (On-Site Review of Possible Exam Compromise)

Chief Examiner: L. Briggs, Senior Operations Engineer/Examiner

Examiners: J. D'Antonio, Operations Engineer/Examiner
J. Williams, Senior Operations Engineer/Examiner

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

SUMMARY OF FINDINGS

IR 05000317-00-301 and 05000318-00-301; on 10/25-29/2000 and 10/10-12/2000; Calvert Cliffs Units 1 and 2; Initial Operator Licensing Examination. All 12 applicants passed (3 SRO, 4 SROI, and 5 RO). Three NCVs and one minor violation of exam security requirements were identified.

The examination was conducted by NRC region-based examiners/inspectors. The follow up inspection identified four findings. Three were treated as "no color" non-cited violations. The fourth was treated as minor violation. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "no color" or by the severity level of the applicable violation.

A. NRC Identified Findings

- **No Color:** The facility licensee failed to maintain positive control of examination material (simulator scenarios) from September 13, 2000, to September 20, 2000 which is contrary to 10 CFR 55.40(b)(2), 10 CFR 55.49, and facility procedure TR-1-104, Development and Control of NRC Operator Licensing Exams, Attachment 2, "Transfer of Exam Materials." The examination material was not signed for by the supervisor when custody was transferred to him (by the individual that signed the material out) or when he returned the exam material. The log was not signed indicating actual location and custody of the exam material until the writer (individual that originally signed the material out on September 13, 2000) signed that it was returned on September 20, 2000.

This NRC identified finding had a very low safety significance (apparent no actual compromise and very low potential for compromise). The bases are that the scenarios most likely were in the locked file cabinet during the period in question (September 13 to 20, 2000); and, if out of the file, they apparently were in the custody of individuals on the signed security agreement. However, the licensee failed to demonstrate proper custody of the examination material. The issue has been entered into the licensee's corrective action system for resolution (Issue Report 3-056-833). This violation of NRC examination security requirements is being treated as a Non-Cited Violation (Section 40A4 b(1)).

- **No Color:** Examination material was developed on a LAN connected personal computer (PC) to which others had access which is contrary to 10 CFR 55.40 (b)(2), 10 CFR 55.49, and facility procedure TR-1-104, Revision 0, Attachment 2. The simulator scenarios were developed on a PC connected to a LAN and developed and stored on a computer network to which the license applicant or other persons not on the security agreement could gain access.

This NRC identified finding had a very low safety significance (apparent no actual compromise and very low potential for compromise). The bases are that there was no access to the exam writer's PC (recycle bin) since 1999 and that special knowledge would be needed to gain access to the electronic files on the LAN connected PC. The issue has been entered into the licensee's corrective action system for resolution (Issue Report 3-056-833). This violation of NRC examination security requirements is being treated as a Non-Cited Violation (Section 40A4 b(2)).

B. Licensee Identified Violation

- **No Color:** The SRO written examination was left in the copy machine contrary to 10 CFR 55.40 (b)(2), 10 CFR 55.49, and facility procedure TR-1-104, Development and Control of NRC Operator Licensing Exams, Attachment 2.

This licensee identified finding had a very low safety significance (apparent no actual compromise and very low potential for compromise). The bases are the written examination copy was in the copier for a short length of time (less than 15 minutes) and other factors involved, such as copier location, the physical appearance of the stapled examination, and applicant whereabouts during the time in question. The issue has been entered into the corrective action system for resolution (Issue Report 3-056-833). This violation of NRC examination security requirements is being treated as a Non-Cited Violation (Section 40A7).

Report Details

4. OTHER ACTIVITIES (OA)

4OA4 Cross Cutting Issues

Reactor Operator and Senior Reactor Operator Initial License Examinations

a. Inspection Scope

The NRC examination team reviewed the written and operating initial examinations submitted by the Calvert Cliffs' training staff to verify or ensure, as applicable, the following:

1. That the examination was prepared and developed in accordance with the guidelines of Revision 8 of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." The review was conducted both in the Region I office and at the Calvert Cliffs facility. Final resolution of comments and incorporation of test revisions was conducted during and following the onsite preparation week.
2. That changes agreed to were incorporated into the test.
3. That the examination met the overall quality goals (range of acceptability) of NUREG-1021, Revision 8 (interim guidance is contained in Report of Interaction 99-18, dated November 24, 1999, and posted on the NRC's internet home page).
4. Proper simulation facility operation.
5. Facility licensee completed a test item analysis for feedback into the systems approach to training programs.
6. Examination security requirements met.

The NRC examiners administered the operating portion of the exam to all applicants from September 25 through 29, 2000. The written examinations were administered by Calvert Cliffs' training staff on September 22, 2000.

b. Issues and Findings

Grading and Results

All 12 applicants (4 SROI, 3 SROU and 5 RO) passed all portions of the initial licensing examination.

The facility did not have any post-examination comments.

Examination Preparation and Quality

The examination met the quality goals of NUREG 1021.

Examination Administration and Performance

There were no generic applicant weaknesses observed during the performance of the examination.

Examination Security Issues

- (1) Failure to demonstrate control of examination simulator scenarios: Follow-up inspection indicated that a hard copy of the examination scenarios had been signed out of the exam development room on September 13, 2000, by the simulator scenario writer (writer) in order to identify simulator scenario critical tasks as requested by the NRC chief examiner. The marked-up scenarios were given to the supervisor overseeing the initial examination development on the evening of September 13, 2000. Although the custody of the exam scenarios was transferred to the supervisor the custody log was not signed to indicate who had custody. The supervisor stated that he had returned the scenarios to the locked file cabinet the same evening that they had been given to him, again the log was not signed.

The scenarios were reviewed in the examination room by the writer and the supervisor on September 14, 2000, to ensure that both individuals agreed on the critical task selection. This review, as the writer recalled, occurred about noon on the 14th. This statement was validated by NRC Region I receipt of the faxed quality checklist indicating the number of critical tasks at 1:37 p.m. on September 14, 2000. The writer stated that following the scenario review he left the examination room and that the supervisor was reviewing the scenarios and other examination material. The supervisor stated that he returned the material to the locked file cabinet, again the log was not signed to indicate that the material was in the file cabinet. The writer stated that on September 20, 2000, he took the floppy disk and the marked-up scenarios from the locked file cabinet and made final revisions to the scenarios in the examination room. He also printed a copy of each scenario in the examination room on the dedicated printer in preparation for making copies for the examination. When the writer returned the floppy disk and the scenarios to the locked file cabinet he verified all scenarios and the floppy disk were properly stored and signed the log indicating the material was returned.

The licensee is required by 10 CFR 55.40(b)(2) to establish, implement, and maintain procedures to control examination security and integrity in accordance with 10 CFR 55.49. Procedure TR-1-104, Development and Control of NRC Operator Licensing Exams, Attachment 2, Transfer of Exam Materials, states: "all exam material leaving the exam room shall be logged to identify the custodian, location and duration the material is to be out of the room." Contrary to these requirements, the examination material was not signed for by the supervisor when custody was transferred to him or when he returned the exam material on or about September 13 and 14, 2000. The log was not signed indicating actual location and custody of the exam material until the writer signed that it was returned on September 20, 2000.

The examiner determined that the scenarios most likely were in the locked file cabinet during the period in question (September 13 to 20, 2000); and, if out of the file, they apparently were in the custody of individuals on the signed security agreement - the

writer and supervisor. However, the licensee failed to demonstrate proper custody of the examination material.

The examiner determined that there was apparently no actual compromise and the potential for compromise was very low. The bases are that the scenarios most likely were in the locked file cabinet during the period in question (September 13 to 20, 2000); and, if out of the file, they apparently were in the custody of individuals on the signed security agreement.

This NRC identified finding had a very low safety significance (no apparent actual compromise and a very low potential for compromise) because of the bases noted above. The issue has been entered into the licensee's corrective action system for resolution (Issue Report 3-056-833). This violation of NRC examination security requirements is being treated as a Non-Cited Violation (**NCV 05000317; 05000318/2000-301-01**).

- (2) Scenario development and printing on a LAN connected computer: The NRC reviewed the corrective actions taken by the licensee to address Issue Report (IR) IR3-008-775 (action item tracking No. 2000-00-666). The problem stated in the IR was "NRC exam material was printed on a LAN connected PC using a non-dedicated computer printer." The supervisor very narrowly answered the printing issue identified in the IR. TR-1-104, Attachment 2, Personal Computers/Local Area Networks, second sentence, states that printing from PCs should be done on dedicated printers. The supervisor noted that the procedure says should, not shall, therefore it was considered guidance, not a requirement. The scenario writer stated that he did not print to the non-dedicated printer, which was about 5 feet from his cubicle, following problem identification in the IR.

Although the supervisor addressed the specific issue identified in the IR he missed the opportunity to identify a broader issue. The broader issue was the fact that the scenario writer was using his PC to develop and store examination scenarios on the "C" drive of his LAN connected computer. TR-1-104, Attachment 2, Personal Computers/Local Area Networks, first sentence, states: "Examination materials will not be placed on a LAN or developed on a PC connected to a LAN."

Because the scenario writer did use his desktop PC to develop simulator scenarios for the NRC examination, the NRC interviewed the writer and, with the help of site information technology services (ITS) personnel, evaluated the possibility of exam compromise through the use of the LAN connected PC. The scenario writer stated that he transferred the scenarios from the "A" drive to the "C" drive of his PC to do the work then transferred the work to the "A" drive when finished. He stated that following that he would delete the files on the "C" drive. A review of the "C" drive (all files) did not locate any copies of the scenarios; however, copies of all 5 scenarios were located in the recycle bin of the computer. ITS personnel accessed the listing of all personnel that had used the scenario writer's PC. All personnel were other licensed operator requalification training (LORT) instructors and all access had been prior to October 1999, which was before starting the development of examination scenarios in late December 1999.

Additional discussion with the ITS personnel revealed that they (with special knowledge) had authority and the ability to access all files on the LAN and could access the "C" drive

of any computer connected to the LAN. This did present another avenue for examination compromise with the special knowledge. The inspector discussed this with licensee management during the debrief on October 12 and during the telephone exit on October 19, 2000. The licensee included this issue in IR 3-056-833.

The licensee is required by 10 CFR 55.40 (b)(2) to establish, implement, and maintain procedures to control examination security and integrity in accordance with 10 CFR 55.49. Procedure TR-1-104, Revision 0, Attachment 2, Personal Computers/Local Area Networks, states that examination materials will not be placed on any LAN or developed on a PC connected to a LAN. In addition TR-1-104 also states in Section 5.1, NRC Exam Security and Integrity, Paragraph G., that exam material will not be developed and/or stored on a computer network to which the license applicant or other persons not on the security agreement could gain access. Examination material was developed on a LAN connected PC to which others had access.

Based on the above NRC review, there was apparently no actual compromise of the NRC examination scenarios and there was a very low potential for compromise. The bases are that there was no access to the exam writer's PC (recycle bin) since 1999 and that special knowledge would be needed to gain access to the electronic files on LAN connected PC.

This NRC identified finding had a very low safety significance (low potential for compromise) for the bases noted above. The issue has been entered into the licensee's corrective action system for resolution (Issue Report 3-056-833). This violation of NRC examination security requirements is being treated as a Non-Cited Violation (**NCV 05000317; 05000318/2000-301-02**).

- (3) Licensed Operator Regualification Training (LORT) Examination Security: As a result of the finding in the initial examination area, the examiner questioned how examination security was controlled for LORT written examination generation and storage. The licensee explained that examination security is discussed in Appendix 1 of the LORT program description and does not follow the TR-1-104 requirements. The LORT examination bank (used for generation and storage) uses a special program (LXR) that is on the "I" drive of the LAN system and is password protected. The "I" drive of the LAN is accessible by the ITS personnel but they would not be able to read or manipulate information without also obtaining the special LXR software.

However, the LORT simulator scenario and JPM banks are also maintained on the LAN system and access is restricted to the instructors in the LORT department. ITS personnel can also access this LORT material.

The security of the LORT written examination material appears to meet the intent of the NRC regulations and NUREG 1021 guidance in this area since the barrier of the password protected software is in the control of the personnel on the security agreements. However, the Simulator scenarios and the JPM bank are more easily accessible by the ITS personnel who are not normally on exam security agreements. This issue is being treated as a minor violation of 10 CFR 55.49. The licensee included the problem in Issue Report 3-056-833 for review and resolution.

40A6 Exit Meeting Summary

On September 29, 2000, the NRC Chief Examiner discussed preliminary overall observations noted during the examination with the General Supervisor, Nuclear Training and other management personnel. On October 12, 2000, the NRC provided a preliminary debrief of the on-site follow-up inspection concerning possible examination compromise. On October 19, 2000, the Chief Examiner and the Chief, Operational Safety Branch, Region I provided final conclusions and examination results, as discussed in this report, to Calvert Cliffs management representative, Mr. J. Lemons, Manager Nuclear Support Services, and other management personnel, via telephone. License numbers for the twelve successful applicants were also provided during the final exit meeting.

The NRC also expressed appreciation for the cooperation and assistance that was provided during the preparation and administration of the exam by the licensee's training staff and examination team.

40A7 Licensee Identified Non-Compliance

Exam Security Issue-SRO Written Exam Left in Copier

On September 22, the licensee called the NRC Chief Examiner at NRC Region I to report that one copy of the SRO written examination had been left in the copy machine sorter for a period of approximately ten minutes. The Chief Examiner in consultation with the Branch Chief discussed the preliminary information with the licensee and allowed the written examination to proceed with the understanding that it could become invalid if it was determined that the examination had actually been compromised.

The licensee is required by 10 CFR 55.40 (b)(2) to establish, implement, and maintain procedures to control examination security and integrity in accordance with 10 CFR 55.49. Procedure TR-1-104, Development and Control of NRC Operator Licensing Exams, Attachment 2, Paper Copies, requires the person that has control and makes copies to verify that no exam material is left in the copy machine. Peer checks are recommended. An inadequate check was made at the copy machine and resulted in a copy of the SRO exam being left in the copy machine sorter for less than 15 minutes before being identified by an administrative assistant familiar with the sensitivity of such material and brought it immediately to the training department for control.

The licensee completed its investigation and NRC follow-up occurred during the exam week of September 25, 2000. The inspector concurred with the licensee's bases for no apparent actual compromise and the inspector noted a very low potential for compromise. The bases is the written examination copy was in the copier for a short length of time (less than 15 minutes) and other factors involved, such as copier location, the physical appearance of the stapled examination, and applicant whereabouts during the time in question.

This licensee identified finding had a very low safety significance (low potential for compromise) for the bases noted above. The issue has been entered into the corrective action system for resolution (Issue Report 3-056-833). This violation of NRC examination security requirements is being treated as a Non-Cited Violation (NCV **05000317; 05000318/2000-301-03**).

PARTIAL LIST OF PERSONS CONTACTED

FACILITY

W. Birney, Supervisor, Requalification Training and Facility Representative
D. Holm, Superintendent, Nuclear Operations
J. Hornick, Supervisor, Initial Licensed Operator Training
J. Kellum, Senior Operations Instructor
J. Lemons, Manager, Nuclear Support Services
R. Niedzielski, Facility Exam Writer
C. Sly, Licensing
N. Winters, General Supervisor, Nuclear Training

NRC

L. Briggs, Senior Operations Engineer/Examiner
J. D'Antonio, Operations Engineer/Examiner
J. Williams, Senior Operations Engineer/Examiner

SUMMARY OF ITEMS OPENED, CLOSED AND DISCUSSED

NRC IDENTIFIED ITEMS OPENED

<u>ITEM NUMBER</u>	<u>TYPE</u>	<u>DESCRIPTION</u>
05000317/2000-301-01 05000318/2000-301-01	NCV	NRC identified that the licensee did not follow procedure TR-1-104 requirements and failed to demonstrate positive control of simulator scenarios during development and review.
05000317/2000-301-02 05000318/2000-301-02	NCV	NRC identified that the licensee did not follow procedure TR-1-104 requirements and developed simulator scenarios using a LAN connected computer to which other persons not on the security agreement had access.

LICENSEE IDENTIFIED ITEM

05000317/2000-301-03 05000318/2000-301-03	NCV	Licensee identified that procedure TR-1-104 had not been followed when a copy of the written SRO examination was left in the copy machine unattended for a period of approximately 10 minutes.
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Attachment 1

SRO WRITTEN EXAM W/ANSWER KEY

**U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination**

Applicant Information

Name:	Region: ① I / II / III / IV
Date: 9/22/00	Facility/Unit: CCNPP 1&2
License Level: RO / <u>SRO</u>	Reactor Type: W / <u>CE</u> / BW / GE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

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

Applicant's Signature

Results

Examination Value	<u>100</u> Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

Name: _____

1. Procedures that address Component Cooling system evolutions, that can change Letdown temperature, direct asking the CRS if it is desirable to bypass the CVCS Ion Exchangers, prior to conducting the evolution. Which one of the following describes the basis for bypassing the Ion Exchanger?
- A. Changes in Letdown temperature cause Ion Exchanger resin to absorb or release particulates, resulting in increased corrosion rates and crud formation.
 - B. Changes in Letdown temperature cause Ion Exchanger resin to absorb or release boron, resulting in reactor power changes.
 - C. Prevents thermal shock to the Ion Exchanger vessel.
 - D. At temperatures above 138°F the Ion Exchanger resin breaks down and can release "resin fines" which will plate out on hot fuel pins, resulting in unpredictable neutron flux patterns.

2. During a DFW transfer from High Power to Low Power Mode, 11 SG levels rises to +26 inches and stabilizes.

Which one of the following actions are taken per OI-12A?

- A. None, level will return to 0 inches when the transfer is complete.
- B. Place 11 SG level input switch to "LT-1111 Failure".
- C. Place the Feedwater Controller Failure switch to "FIC-1111 Fail" and manually operate 11 SG FRV from PDI-4516.
- D. Place FIC-1111 and LIC-1105 in manual to override the "freeze" and manually complete the transfer.

3. The basis for the high limit on RCS Subcooled Margin, in EOP-4, is to prevent PTS (Pressurized Thermal Shock). What is the reason for this limit to lower, as the plant ages?

- A. Work hardening of the Pressurizer Spray Nozzles.
- B. Reduced thermal conductivity of the Reactor Vessel.
- C. Neutron embrittlement of the Reactor Vessel.
- D. Newer, more accurate, metallurgical analysis of the Reactor Vessel Head Bolts.

4. The Unit is at full power. The RO is directed to report to the Shift Manager in his office to discuss a surveillance he recently performed. The CRO is to relieve the RO during the meeting.

Which one of the following describes the minimum action the RO is REQUIRED to perform per NO-1-200 (Control of Shift Activities)?

- A. Verbally brief the CRO.
- B. Walkdown the panels with the CRO.
- C. Inform the CRS of the meeting subject, duration and the location.
- D. Complete all requirements listed in NO-1-207 (Nuclear Operations Shift Turnover).

5. Given the following:

- Unit 1 is defueled and Unit 2 is in Mode 5
- Alarm "SFP TEMP HI" annunciates at 1C13

Select the cooling mechanisms in preferred order per AOP-6F (SFP Cooling Malfunctions):

- A. Line up Unit 1 SDC to SFP system, place second SFP cooler in service, add makeup to SFP as water boils off.
- B. Place second SFP cooler in service, line up Unit 1 SDC to SFP system, add makeup to SFP as water boils off.
- C. Line up Unit 2 SDC to SFP system, place second SFP cooler in service, add makeup to SFP as water boils off.
- D. Place second SFP cooler in service, line up Unit 2 SDC to SFP system, add makeup to SFP as water boils off.

6. A new electric motor has been installed on an existing pump. The MO requires the motor to be checked for proper rotation and not all clearances have been returned.

Which one of the following actions are required to remove the Danger Tag from the motor power supply? (assume the pump suction and discharge valves are to remain tagged out)

- A. Process a Supplementary Clearance.
- B. Process a modification to the tagout.
- C. Clear all tags and use a "human danger tag" for equipment not ready for operation.
- D. Verbally authorize the "lifting" of the motor tag and re-tag after rotation check.

7. An operator is assigned a task to monitor a resin transfer line for blockage. The operator's current dose for the year is 1200 mrem. The task is expected to result in a dose of 100 mrem.

Describe the procedure, if required, for extending the administrative dose limit:

- A. No administrative dose limit extension is needed.
- B. Dosimeter record review, Shift Manager and GS-NO approvals.
- C. Dosimeter record review, GS-NO and GS-RS approvals.
- D. EPD functional review, RadCon S/S and Shift Manager approvals.

8. Given the following:

- * Unit 2 is in Mode 5
- * PAL interlocks are defeated
- * Containment Equipment hatch is installed
- * Spent fuel moves are in progress in the SFP area

Which one of the following describes the condition required to maintain operability of SFP ventilation?

- A. Line-up Containment Purge with Supply fan OFF and Exhaust Fan ON.
- B. Containment Equipment Hatch must be secured with all bolts.
- C. Line-up Containment Purge with both the Supply and Exhaust fans ON.
- D. Containment Equipment Hatch must be secured with at least 4 bolts.

9. Which one of the following describes the proper action(s) for a reactor trip and a subsequent severe fire requiring a Control Room Evacuation?

- A. Implement EOP-0.
- B. Implement AOP-9A.
- C. Implement EOP-0, then return to AOP-9A.
- D. Parallel implement EOP-0 and AOP-9A.

10. During the performance of EOP-0, the RO observes the following plant conditions for the Pressure and Inventory Safety Function:

- * Pzr level is at 70 inches and steady
- * 3 Charging pumps are running
- * Letdown was isolated prior to the reactor trip
- * RCS pressure is 1900 PSIA and steady
- * RCS Subcooling is 95 °F and steady

The FINAL report from the RO to the CRS regarding the status of Pressure and Inventory Control Safety Function should be:

- A. COMPLETE.
- B. MONITORING.
- C. CANNOT BE MET.
- D. TAKING ALTERNATE ACTIONS.

11. Given the following:

- * Unit 1 120VAC bus 1Y01 has been lost.
- * Operators are directed by AOP-7J (Loss of 120 Vital AC Power) to stop the Containment Radiation Monitor pump.

Which one of the following is the reason for securing the pump?

- A. To prevent an inadvertent restart of the pump when the bus is repowered .
- B. To avoid reliance on the low flow trip to protect the pump.
- C. To prevent an inadvertent alarm when the bus is repowered .
- D. To establish containment integrity for the affected penetration.

12. During the heat up of Unit 2 from Mode 5, when the Unit reaches NOT and NOP, the RO reports 22B RCP temperature trends have slowly increased during the heatup of the RCS, and are consistently running higher than the other RCPs.

Which one of the following is the correct action to respond to the 22B RCP temperature trend?

- A. Verify CC 3832 and 3833 open.
- B. Start a second CC pump.
- C. Check CC flow to 22B RCP ~ 50 GPM higher than the other RCPs.
- D. Check RCP integral heat exchanger for leakage.

13. What CRO action must be taken on Unit 2 in the "Ensure Turbine Trip" block step to prevent an overcooling of the RCS, per EOP-0? (The Turbine Speed was observed to be decreasing)

- A. Press "Close Valves" button on the turbine control panel.
- B. Press "Reset" button on the MSR control panel.
- C. Observe that MSR source valves go shut.
- D. Shut both MSIVs.

14. One of the first actions the operator is instructed to take per AOP-6A (Abnormal Reactor Coolant Chemistry/Activity) on increased RCS activity is to adjust letdown flow.

Which one of the following statements is correct as to the adjustment and the reason?

- A. Increase letdown to maximum to divert RCS water for processing by the RCW Processing System.
- B. Decrease letdown to minimum to minimize the amount of radioactive letdown that is flowing throughout the Auxiliary Building.
- C. Isolate letdown until the cause of the activity increase can be determined by chemistry technicians.
- D. Increase letdown flow to obtain the maximum purification flow.

15. Following a Loss of Offsite Power, natural circulation flow can not be accurately verified for approximately 15 minutes.

Which one of the following is the cause of this time delay?

- A. Time for Reactor Coolant Pump coastdown.
- B. Formation of Steam Generator inverted delta T.
- C. Time for Low Steam Generator levels recovery.
- D. Increased loop cycle time.

16. Given the following:

- * Unit 1 is in Mode 3 at NOT and NOP
- * A total loss of Component Cooling occurs
- * AOP-7C (Loss of Component Cooling Water) is implemented and RCPs are stopped
- * All RCP lower seal temperatures are < 250 °F
- * The CRS directs the start of 12 CC pump per AOP-7C

Which of the following is the correct valve lineup for RCP restart after completion of AOP-7C actions?

- A. SHUT 1-CC-3832-CV (CC CNTMT SUPPLY) valve prior to RCP restart.
- B. SHUT 1-CC-284 (CC CNTMT SUPPLY HDR ISOL) prior to RCP restart.
- C. OPEN 1-CC-3832-CV (CC CNTMT SUPPLY) valve prior to RCP restart.
- D. OPEN 1-CC-284 (CC CNTMT SUPPLY HDR ISOL) prior to RCP restart.

17. Given the following:

- * Unit 1 is in Mode 3 preparing for RCS cooldown to Mode 5
- * The CRO reports that 1C13 panel indication 11 Salt Water header pressure is reading 9 PSIG and both the salt water flow on the 11 SW header and 11 CCHX have increased

Which one of the following describes the required actions based on plant conditions?

- A. Implement AOP 7A (Loss of Saltwater Cooling) and reduce 11 Salt Water header flow by placing 11A/11B SRWHX SW Bypass, 1-PIC-5154, in AUTO.
- B. Implement AOP 7A (Loss of Saltwater Cooling) for a rupture on the 11 CC Heat Exchanger header.
- C. Direct the OSO to throttle 11 SW pump discharge to raise SW header pressure per OI-29 (Saltwater System).
- D. Start 13 SW pump on 11 SW header to raise SW header pressure per OI-29 (Saltwater System).

18. Given:

- * Both Units 1 & 2 were at 100% power
- * A Loss of Offsite Power occurred
- * All DGs started and loaded as expected
- * EOP-0 was implemented for both units
- * Condenser vacuum is 22" HG on both Units

What is the correct steam dumping capability of each Unit:

- A. Unit 1 TBVs are operable, Unit 2 TBVs are operable.
- B. Unit 1 TBVs are inoperable, Unit 2 TBVs are operable
- C. Unit 1 TBVs are inoperable, Unit 2 TBVs are inoperable.
- D. Unit 1 TBVs are operable, Unit 2 TBVs are inoperable

19. Given the following:

- * Unit 1 is in Mode 6 with refueling in progress
- * The Containment Outage Door is shut
- * The PPO reports the Equipment Hatch has 1 out of 4 bolts loose
- * AOP-4A (Loss of Containment Integrity) is implemented

Determine the actions required based on plant conditions:

- A. Verify the Containment Outer Door is secured per NO-1-114, Containment Closure
- B. Secure Core Alterations immediately and establish Containment Closure per STP O-55A-1.
- C. Verify the Containment Outer Door is secured per STP O-55A-1 and suspend Core Alterations if unsat.
- D. Secure Core Alterations immediately and document the Containment Closure deviation per NO-1-114.

20. Given the following:

- * Both Units are at 100% power when a Loss of Offsite Power event occurs
- * EOP 0 is implemented on both Units
- * Concurrent with EOP 0 implementation, a loss of suction on the AFW common suction header occurs in the Unit 1 Turbine Building
- * The appropriate optimal recovery procedure is implemented for each Unit
- * The following parameters are observed:

	Unit 1	Unit 2
RCS pressure	1800 PSIA and lowering	1900 PSIA and rising
RCS Tc (~15 min later)	475 °F and lowering	505 °F (after rising uncontrollably from 495 °F)
11 (21) SG level	-360 inches	-300 inches
12 (22) SG level	-300 inches	-300 inches

AFW Suction header is restored after venting

Evaluate the proper actions to be taken on both Units based on stated plant conditions:

- A. Establish AFW flow on Unit 1 and Unit 2.
- B. Initiate OTCC on Unit 1 and throttle OPEN ADVs on Unit 2.
- C. Establish AFW flow on Unit 1 and initiate OTCC on Unit 2.
- D. Initiate OTCC on Unit 1 and increase AFW flow to Unit 2.

21. Given the following:

- * Unit 2 is at 100% power
- * All control systems are in automatic
- * Pressurizer Spray is stuck open
- * NO operator action is taken

Which one of the following describes the effect of RCS pressure DECREASING to 2205 PSIA?

- A. Pressurizer "PZR CH 100 PRESS" alarm is annunciated.
- B. Proportional heaters are fully energized.
- C. Proportional heaters are partially energized.
- D. All Backup heaters are energized.

22. A discharge of the Miscellaneous Waste Monitor Tank is in progress.

Which one of the following conditions would require entry into AOP-6B (Accidental Release of Radioactive Liquid Waste)?

- A. Trip of a Circ Water Pump on the unit receiving the discharge with no corresponding reduction in discharge flow rate.
- B. Liquid Waste Discharge valves 2201-CV and 2202-CV OPEN with discharge RMS alarm.
- C. Discharge activity exceeds the computer alarm high setpoint specified in the release permit.
- D. Discharge activity decreases to less than the Discharge Permit background activity value.

23. Given the following:

- * CEA 1 drops to the bottom on Unit 1
- * AOP-1B (CEA Malfunction) is implemented
- * Reactor power is being maintained constant during the recovery of the CEA

Which one of the following is a method used to maintain reactor power?

- A. Adjust Turbine load to compensate for the reactivity effects of CEA withdrawal.
- B. Fast Borate to compensate for the reactivity effects of the CEA withdrawal.
- C. Insert Group 1 CEAs to compensate for the reactivity effects of the CEA withdrawal.
- D. Dilute RCS to compensate for the reactivity effects of the CEA withdrawal.

24. Given the following:

- * A transient occurs on Unit 1
- * EOP-0 is implemented and alternate actions are required to trip the reactor
- * All Safety Functions are complete

Which one of the following breakers would be reclosed after actions to trip the reactor?

- A. 11A 480V normal feeder breaker and 12A 480V tie breakers are closed.
- B. 12A 480V and 13A 480V normal feeder breakers are closed.
- C. 12A 480V and 13B 480V normal feeder breakers are closed.
- D. 12B 480V and 13A 480V normal feeder breakers are closed.

25. Given the following:

- * Unit 1 is in Mode 2 and at the POAH
- * The RO withdraws CEA Regulating Group 4 to raise power and enter Mode 1
- * After the RO releases the Raise/Lower Switch, he observes a steady rise in Reactor power and RCS temperature
- * Primary CEA Group 4 selected light is indicating withdrawal

Which one of the following describes the required action per AOP-1B?

- A. Insert CEAs to initial position to stop the power increase at the desired point in mode 1.
- B. Place the Raise/Lower Switch to LOWER and monitor CEA position indications for Regulating Group 4.
- C. Trip the Reactor and implement EOP-0.
- D. Place the CEDS system in OFF and monitor CEA position indications for Regulating Group 4.

26. In accordance with the basis document, which of the following is the reason for tripping 2 RCPs at 1725 psia and the last 2 RCPs when RCS temperature/pressure are less than minimum RCP operating limits during a LOCA?

- A. Minimize pump cavitation and/or air binding which would result in pump/motor damage.
- B. Minimize the loss of RCS inventory during a break at the bottom of the hot leg.
- C. Minimize the loss of RCS inventory during a break at the bottom of the cold leg.
- D. Minimize the heat input from the pumps thereby minimizing core damage.

27. Which condition occurs on a loss of +15 VDC power to the W.R. flux trip relays 1 & 2?

- A. SUR trip inhibited.
- B. Zero power mode bypass enabled.
- C. CEAPDS PDIL enabled.
- D. TM/LP signal to CWP inhibited.

28. A charging header leak would be identified by which one of the following?

- A. Lowering pressurizer level with minimum letdown flow and one charging pump operating.
- B. Charging header pressure greater than RCS pressure with two charging pumps operating.
- C. Charging header flow equals letdown flow with one charging pump operating and VCT level is lowering.
- D. Charging header pressure less than RCS pressure with one charging pump operating.

29. After isolating a S/G that has a ruptured tube, which one of the following is the preferred method for maintaining control of the level in the S/G?

- A. Steaming to the condenser.
- B. Blowdown to the condenser.
- C. Backfill to the RCS.
- D. Blowdown to the MWS.

30. Chemistry reports that the calculated Steam Generator primary-to-secondary leak rate is 50 GPD. The CRS has the appropriate AOP implemented.

Which one of the following describes the actions that are expected?

- A. Secure SG Surface and Bottom Blowdown Valves.
- B. Implement AOP-2A (Excessive Reactor Coolant Leakage) and commence a Plant shutdown.
- C. Monitor SG level for an unexplained rapid increase.
- D. Review AOP-2A (Excessive Reactor Coolant Leakage), EOP-6, EOP-8 and OP-3 Appendix B (Rapid Power Reduction).

31. Given the following:

- * Unit 2 tripped from 100% power
- * EOP-0 "Post Trip Immediate actions" are being performed
- * The Main Turbine did not trip as expected

Which one of the following actions should be performed per EOP-0 to trip/stop the turbine?

- A. Manually close both MSIVs.
- B. Manually stop EHC pumps.
- C. Manually Shut Turbine Throttle Valves using Test pushbuttons.
- D. Locally trip the Turbine from the front standard.

32. Given the following:

- * Unit 2 was manually tripped from 100% power due to a steam leak in the MSIV room
- * EOP-0 is implemented
- * RO reports Reactivity Control cannot be met due to positive SURs
- * All other Safety Functions are met

Determine the appropriate actions for the plant conditions:

- A. Reassess the EOP-0 Safety Functions and implement the optimal recovery procedure.
- B. Implement the alternate actions for Reactivity Control Safety Function to mitigate the ATWS event.
- C. Implement EOP-8 and determine success paths using the Resource Assessment Table.
- D. Implement EOP-4 to address reactivity control and isolate the steam leak.

33. Given the following:

- * Unit 1 is at 100% power
- * 1Y01 (11 120V Vital AC bus) had been deenergized for emergency maintenance and is ready to be energized
- * The CRS directs you to reenergize 1Y01 per OI 26B (120 Volt Vital AC and Computer AC)

Which one of the following describes an expected result from improper implementation of the applicable procedure steps?

- A. ESFAS ZB logic channel could actuate if cabinet is not shutdown per OI-34 prior to energizing 1Y01.
- B. Unit 2 Channel A WRNI at 2C43 Preamplifier may be damaged if power is restored prior to IM discharging the Fission Chamber.
- C. Unit 2 Channel A LRNI at 2C43 Preamplifier may be damaged if power is restored prior to IM discharging the Fission Chamber.
- D. ESFAS ZE sensor channel could trip if cabinet is not shutdown per OI-34 prior to energizing 1Y01.

34. During the performance of a waste gas release from 11 WGDT, WGS-2191-CV is found failed closed by the ABO.

Which valve must be closed promptly per AOP-6C (Accidental Gaseous Waste Release) to prevent an inadvertent release from WG Surge Tank?

- A. WGS-2191-PCV (WG discharge flow control).
- B. WGS-623 (11 WGDT outlet).
- C. WGS-630 (WG discharge final filter bypass).
- D. WGS-683 (WG discharge to unit 1 plant vent).

35. A Generator Core Monitor alarm is received. When the filter pushbutton is depressed, as directed by the Alarm Manual, the indication increases.

What does this mean and why does it happen?

- A. It is an invalid alarm condition. The filter is removing normal impurities in the generator cooling gas.
- B. It is a valid alarm condition. The filter is removing impurities caused by the insulation breakdown within the generator.
- C. It is a valid alarm condition. The filter adds ions to the detector chamber to test instrument response.
- D. It is an invalid alarm condition. The filter is malfunctioning causing detector response to increase.

36. Which one of the following is correct concerning a loss of Instrument Air pressure?

- A. Pressurizer Spray Valves fail OPEN.
- B. Condensate Demineralizer Bypass Valve fails OPEN.
- C. Pressurizer Auxiliary Spray Valve fails SHUT.
- D. Containment Spray Control Valves fail SHUT.

37. Given the following:

- * Unit 1 is at 100% power
- * A LOCA occurs when 1 PORV fails open
- * SIAS and CIS actuate.

Which one of the following describes the initial response of ESF components?

- A. 11 and 12 CS pumps start and CS flow is ~2700 GPM total flow.
- B. 11 and 12 HPSI pumps start and inject water below ~1300 PSIA.
- C. 11 and 12 LPSI pumps start and inject water to the RCS.
- D. 11 and 13 HPSI pumps start and inject water below ~1300 PSIA.

38. Which one of the following is the effect from deenergizing the LRNI level 2 bistable?

- A. Enables APD trip.
- B. Enables Power Trip Test Interlock (PTTI).
- C. Energizes Channel in Test LED.
- D. Enables Loss of Load Trip.

39. Given the following:

- * Unit 1 is in Mode 3 with a reactor startup in progress
- * The RO is withdrawing Regulating Group 1 CEAs in Manual Group mode
- * Regulating Group 1 is at 120 inches
- * No CEA deviations exist

Which one of the following will be the first to automatically stop CEA movement?

- A. Highest CEA reaches the Upper Computer Stop (UCS).
- B. Lowest CEA reaches the Upper Computer Stop (UCS).
- C. Highest CEA reaches the Upper Electrical Limit (UEL).
- D. Lowest CEA reaches the Upper Electrical Limit (UEL).

40. Given the following:

- * Unit 1 is in Mode 5, preparing for RCPs start
- * Unit 2 is in Mode 6
- * 12 13.8 KV Bus voltage is reading 14.8 KV
- * 22 13.8 KV Bus voltage is reading 15.2 KV

Which one of the following is the required action for the plant conditions?

- A. Start Unit 1 RCPs on 12 13.8 KV Bus and verify bus voltage drops to 14.5 KV.
- B. Start Unit 1 RCPs on 22 13.8 KV Bus and shift RCP power to 12 13.8 KV bus when it's voltage increases to ≥ 15.2 KV.
- C. Verify 4 KV Bus voltages are less than 4100 volts and start Unit 1 RCPs on 12 13.8 KV Bus.
- D. Verify 4 KV Bus voltages are greater than 4100 volts and start Unit 1 RCPs on 22 13.8 KV Bus.

41. The CRO is directed to place the AFW speed/flow controllers at 1(2)C43 to the "MIN" position before their respective hand transfer valves are placed in POSITION 2 during AOP-9A (Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire) .

Which one of the following is the reason for the required action?

- A. To remove the air signal to the CVs and allow the CRO to have control of the AFW from 1(2)C43.
- B. To place the AFW pumps at a normal discharge pressure and shut the AFW flow CVs to allow a controlled feed rate.
- C. To place the pumps and CVs in a known position and prevent an uncontrolled RCS cooldown from occurring.
- D. To maintain AFW flow to the SGs to prevent a SG dryout condition until 13 (23) AFW pump is running.

42. Which one of the following describes a design flowpath of the MW Processing System?

- A. MWRT is pumped by the MWRT pump through the MWS filter and IX and IX outlet strainer to 11 RCWMT.
- B. MWMT is pumped by the MWMT pump through the MWS filter and IX and IX outlet strainer to 11 RCWRT.
- C. MWRT is pumped by the MWRT metering pump through the MWS filter and IX to 12 RCWMT.
- D. MWMT is pumped by the MWMT metering pump through the MWS filter and IX to 11 RCWRT.

43. Given the following:

- * Unit 1 is in Mode 5
- * Unit 2 is in Mode 6 with core off-load in progress
- * The Control Room Recirculation Signal (CRRS) is declared inoperable

Which one of the following is the required Tech Spec/TRM action, if any?

- A. Place 1 CREV System train in recirc with Post-LOCI fan in service within 4 hours.
- B. No action required by Tech Spec due to LCO is not applicable for either Unit.
- C. Place 1 CREV System train in recirc with Post-LOCI fan in service immediately.
- D. No action is required by TRM due to condition is not applicable for either Unit.

44. Given the following:

- * Unit 1 is at MOC and 100% power
- * Chemistry requests 13 Purification IX to be placed in service
- * The ABO reports that the "unborated IX" sign is hanging on the inlet valve 1-CVC-146

Which one of the following is the proper response for the plant conditions?

- A. Ensure 1-CVC-520-CV, IX Bypass, is in the BYPASS position and direct the ABO to remove the sign.
- B. Notify the CRS of a possible reactivity change and lower L/D temperature to minimize the effects of the unborated resin.
- C. Ensure 1-CVC-520-CV, IX Bypass, is in the AUTO position and direct the ABO continue placing 13 Purification IX in service.
- D. Notify the CRS of a possible reactivity change due to placing 13 Purification IX in service.

45. The Chemistry Tech has reported to the CRS that the weekly sample of the onservice WGDT has been completed. The analysis results are 4 curies of noble gas and 4.5% O₂ by volume.

What are the required actions for the sample results per TRM?

- A. Isolate the on-service WGDT and prepare a permit for a discharge.
- B. Maintain the on-service WGDT in service, have RCS sampled for activity.
- C. Isolate the on-service WGDT, reduce O₂ concentration in WG system immediately.
- D. Maintain the on-service WGDT in service, monitor letdown process rad monitor.

46. Given the following:

- * Unit 2 was at 100% power when a LOOP and large break LOCA occurred
- * All Emergency Diesels started and loaded as designed

Which one of the following describes the expected configuration of the Containment Cooling Systems?

- A. 4 CACs running in FAST speed and 2 CS pumps are injecting water into the containment atmosphere at > 1400 GPM.
- B. 4 CACs running in SLOW speed and 2 CS pumps are injecting water into the containment atmosphere at ~ 1300 GPM.
- C. 4 CACs running in FAST speed and 2 CS pumps are injecting water into the containment atmosphere at ~ 1300 GPM.
- D. 4 CACs running in SLOW speed and 2 CS pumps are injecting water into the containment atmosphere at > 1400 GPM.

47. Given the following:

- Unit 1 is at 10% power with a Plant startup in progress
- Alarm "12 SG CONTR CH LVL" annunciates at 1C03
- RO reports that 12 SG level by 1-LT-1106 indicates +63.5" and remaining SG level indications are at 0"

Describe the effect on the Plant and action required:

- A. 12 Bypass Feedwater Valve will go SHUT requiring a manual Reactor trip and implementation of EOP-0.
- B. 12 Bypass Feedwater Valve will continue to maintain level, the downcomer selector switch at 1C36 should be placed in the LT-1106 failure position to provide LT-1121 input to the control channel indication.
- C. 12 Bypass Feedwater Valve will go SHUT, requiring manual operation by placing its associated handswitch in the BYPASS FAIL position.
- D. 12 Bypass Feedwater Valve will continue to maintain level, a manual transfer from LOW to HIGH power of the DFWCS will be required for 12 Feed System.

48. Using the provided reference and given the following:

- * Unit 1 is at 100% power
- * Regulating Group 5 CEAs are at 129 inches for testing
- * CEA 1 Pulse counting position indicator indicates 129 inches while CEAPDS indicates 124 inches

Which one of the following describes the actions (if any) that comply with the TRM requirements?

- A. TRM requirements are met, no actions are required.
- B. Restore the CEAPDs indication within 6 hours.
- C. Borate power to <70% and withdraw CEA 1 to FULL OUT position within 6 hours.
- D. Borate power to <70% and withdraw Group 5 to FULL OUT position within 6 hours.

49. Given the following:

- * Unit is at 100% power
- * "CSAS ACTUATED" alarm is annunciated at 1(2)C08
- * Containment pressure indicates .5 PSIG

Which one of the following describes the expected system response?

- A. CS pump(s) running and SI-4150 and/or SI-4151 is/are OPEN.
- B. PS-6531-SV, Quench Tank sample valve is SHUT.
- C. SI-4150 and/or 4151 is/are OPEN.
- D. NO system response due to a spurious actuation has occurred.

50. A CAR unit has been shutdown and the inlet CV has failed to shut. If the CAR is in the "Holding Mode", describe the effect, if any:

- A. Air will not leak into the condenser.
- B. Air will leak into the condenser via the seal water recirc pump.
- C. Air will leak into the condenser via the hogging CV.
- D. Air will leak into the condenser via the three way valve.

51. Given the following:

- * Unit 1 is in Mode 3
- * SIAS Pressurizer Pressure Blocked on both logic channels
- * RCS pressure being reduced to 1500 PSIA
- * PZR Spray valves fail shut and RCS pressure starts to rise

Select the expected system response as pressure rises:

- A. SIAS Pressurizer Pressure Block will be manually removed when the RO goes to "NORMAL" at 1800 PSIA with the keyswitch for SIAS Block A at 1C10.
- B. SIAS Pressurizer Pressure Block will be automatically removed when 2 SIAS Pressurizer Pressure Block sensors clear
- C. SIAS Pressurizer Pressure Block will be manually removed when the RO goes to "NORMAL" at 1800 PSIA with both keyswitches for SIAS Block A and B at 1C10.
- D. SIAS Pressurizer Pressure Block will be automatically removed when 1 SIAS Pressurizer Pressure sensor clears.

52. Given the following:

- Unit 1 is at 100% power
- The 1B DG is running unloaded for post maintenance testing, Electric Shop and Mechanical maintenance personnel are standing by in the 1B DG Room
- CRO reports a "1B DG" alarm is received at 1C18B
- OSO reports a "START FAILURE" alarm is received at the 1B DG Alarm panel
- Electricians suspect blown fuses, requesting to replace them immediately.

Using the provided electrical schematic, determine which fuse(s) have blown, resulting in the indicated response on the 1B DG:

- A. Fuses FU7 and FU8 due to the start failure alarm that was annunciated from the loss of control power.
- B. Fuses FU1 and FU2 due to the start failure alarm that annunciated from the loss of control power.
- C. Fuses FU3 and FU4 due to start failure alarm from the engine running with the air start solenoids failed close.
- D. Fuses FU5 and FU6 due to the start failure alarm from the loss of power to the low speed and auxiliary stop relays.

53. Given the following:

- * Unit 1 is in Mode 3
- * RCS pressure is 325 PSIA and temperature is 355 °F
- * PORV Block Valve RC 403 is OPEN
- * PORV Block Valve RC 405 is SHUT
- * HS 1406 (PORV 402 MPT Protection) is in "VARIABLE MPT ENABLE"
- * HS 1408 (PORV 404 MPT Protection) is in "NORMAL"
- * PORV 402 override is in "AUTO"
- * PORV 404 override is in "AUTO"
- * PT 103-1 Pressurizer Low Range pressure transmitter fails to 1500 PSIA

Which one of the following describes the response to the conditions?

- A. ERV-402 stays ENABLED and OPENS.
- B. ERV-404 is ENABLED and OPENS.
- C. ERV-402 stays ENABLED and remains SHUT.
- D. ERV-404 is ENABLED and remains SHUT.

54. The most serious failure for the Spent Fuel Pool Cooling System is the loss of SFP Water. What feature of the system is designed to prevent this?

- A. Piping interconnection to either RWT.
- B. Piping interconnection from Safety Injection systems.
- C. Two channels of remote level indication with alarm function.
- D. SFP pipe connections with siphon breakers, above the water level in SFP.

55. A smoke detector fails and goes into alarm for the Unit 1 27 Foot Switch Gear Room.

Which one of the following describes the effect on the system?

- A. Pre-Alarm buzzer sounds and after a time delay, Halon system discharges.
- B. Pre-Alarm buzzer sounds but does not result in Halon system discharge.
- C. Discharge warning horn sounds and after a time delay, Halon system discharges.
- D. Discharge warning horn sounds but does not result in Halon system discharge.

56. Given the following:

- Unit 2 is 100% power
- LT-110X Pressurizer level channel selected
- HS-100-3, Pzr Htr Lo Lvl cut-off is selected in "X / Y" position

Describe the effect on the RCS if LT-110X fails due to a leak in the reference leg:

- A. Indicated Pressurizer level will increase due to Letdown going to minimum and backup charging pumps stop.
- B. Indicated Pressurizer level will decrease due to Letdown going to maximum, exceeding Charging pump capacity.
- C. Actual Pressurizer level will decrease, Letdown goes to maximum, PZR Backup Heaters energize.
- D. Actual Pressurizer level will increase, Letdown goes to minimum, backup Charging pumps stop.

57. Given the following:

- * Unit 2 is a 100% power
- * All control systems in automatic
- * Reactor trips on MT EHC system failure

Which one of the following describes the expected plant response?

- A. Post-trip DFWCS relay is energized, MFVs ramp shut over 20 seconds, BFVs open to 56%.
- B. DFWCS shifts to low power mode on RRS NI power input, BFVs open to 33%.
- C. Post-trip DFWCS relay is deenergized, MFVs ramp shut over 30 seconds, BFVs open to 65%.
- D. DFWCS shifts to low power mode after 20 seconds by relays from MT trip circuit, BFVs open to 65%.

58. Unit 1 is at full power when a reduction occurs in the Instrument Air Header pressure. The CRO observes that IA header pressure has decreased to 85 PSIG and PA Header is at 85 PSIG also.

Which one of the following describes the expected automatic action that will occur at this pressure?

- A. PA-2061-CV, PA to IA Cross connect Valve OPENS.
- B. PA-2059-CV, PA header Isolation Valve SHUTS.
- C. Standby Instrument Air Compressor STARTS.
- D. IA-2085-CV, Containment IA Isolation Valve SHUTS.

59. Given the following:

- Unit 1 is in Mode 6
- Fuel Handling is in progress
- Containment Purge is in operation

Which of the following monitors should **NOT** be functionally tested per OI-35 (Radiation Monitoring System)?

- A. Fuel Handling Area Monitor (RI-5420).
- B. Containment Area Radiation Monitor (RI-5316A-D).
- C. Main Vent Gas Monitor (RI-5415).
- D. Containment ICI Area Monitor (RI-7008).

60. Given the following:

- Unit 1 is in Mode 3, NOT and NOP (previously was at 100% power for 245 days)
- Chemistry reports that the trend on weekly samples indicate an increase in the RCS activity for non-soluble matter
- NFM reports that a review of CECOR data indicates that fuel rod fouling is increasing

Which condition will cause 1C07 alarm F-21 "RAD MON LVL HI" to alarm AND a dose rate change in the Letdown line?

- A. LOCA inside the Containment resulting in stopping RCPs after CIS actuation.
- B. LOCA outside the Containment resulting in activity in the 27 Foot West Penetration Room.
- C. Establishing forced circulation by starting RCPs after a Loss of Offsite Power.
- D. Starting additional Charging pumps in response to an RCS leak.

61. Given the following:

- * Both Units are at 100% power
- * MS line Rad Monitor status:

	Unit 1 (11/12)	Unit 2 (21/22)
NORM White light	on/on	on/on
FAIL Green light	off/off	on/on
ALERT Amber light	off/on	off/off
HIGH Red light	off/on	off/off

Which one of the following describes the operational status of the RMS?

- A. Unit 1 both operable and Unit 2 both inoperable.
- B. Unit 1 one RMS inoperable and Unit 2 one RMS inoperable.
- C. Unit 1 both RMS inoperable and Unit 2 both RMS inoperable.
- D. Unit 1 both RMS inoperable and Unit 2 both RMS operable.

62. Given the following:

- * A LOCA has occurred on Unit 2
- * EOP 5 has been implemented
- * CRO has started the H₂ Recombiners per OI-41A (Hydrogen Recombiners)
- * The CRO later observes that 21 H₂ Recombiner has malfunctioned and 22 H₂ Recombiner is operating satisfactorily

Which one of the following describes the required action, if any, to control H₂ volume to <4% during a LOCA?

- A. Containment H₂ control will require the repair of 21 H₂ Recombiner within 24 hours.
- B. Containment H₂ control will require the use of the Hydrogen Purge System within 24 hours.
- C. Containment H₂ control will require the use of alternate procedures from the TSC.
- D. No further actions are required to maintain H₂ <4% by volume by design.

63. Given the following:

- * Unit 1 is in Mode 6 with fuel off-load in progress
- * RFM is being operated in AUTO mode
- * Off indexing is being used during a fuel assembly insertion in the core
- * OFF INDEX ZONE BREACHED is indicated on the CRT

Which one of the following is the action required to complete the fuel move?

- A. Raise the fuel to the hoist up limit and select SEMI-AUTOMATIC mode to reposition the RFM to the Off index zone.
- B. Lower the hoist in slow speed until the Upper Grapple Operate Zone and position the RFM to On Index.
- C. Use TRAVEL OVERRIDE to return within the Off index zone and continue with hoist lowering.
- D. Reset the alarm by depowering the RFM console and complete the fuel move from the RFM in MANUAL ELECTRIC control.

64. Which one of the following conditions is indicated when the LOAD CHANNEL light on the Unit 2 turbine control panel is lit?

- A. Failure in the Impulse Pressure feedback loop has occurred and the EHC system is in the IMP OUT mode.
- B. Failure in the Impulse Pressure feedback loop has occurred and the EHC system is in the TURBINE MANUAL mode.
- C. Failure of the Turbine Actual Reference counter has occurred and the EHC system is in the TURBINE MANUAL mode.
- D. Failure of the Turbine Actual Reference counter has occurred and the EHC system is in the IMP OUT mode.

65. Which one of the following is the design basis for the Quench Tank volume?

- A. Continuous discharge of both PORVs with no operator action.
- B. Continuous CEA withdrawal event from low power.
- C. Continuous RCS degassing using both Reactor Vent Valves.
- D. Continuous discharge from 1 Primary Safety Valve during loss of load event.

66. Given the following:

- * Unit 1 Reactor is manually tripped from 100% power
- * 11 RCS hot leg loop RTD to RRS fails high to 615°F
- * No operator action is taken

Which one of the following describes the initial response of the ADVs and TBVs and final plant conditions?

- A. ADVs and TBVs both OPEN due to Quick Open signal for a longer period of time than normal, then the TBVs will SHUT and ADVs control RCS at a lower temperature band around 505 °F .
- B. The failed input to RRS is deleted by the Tave calculator, ADV and TBV operation is unchanged (including Quick Open) with RCS temperature control by the ADVs at the expected post trip band of ~532 °F .
- C. The failed input to the RRS inhibits the Quick Open features of the ADVs and TBVs resulting in both a lift of MSSVs and ADVs and TBVs staying open longer with the RCS temperature control by the ADVs at a lower temperature band ~ 505 °F .
- D. ADVs and TBVs both OPEN due to Quick Open signal for a longer period of time than normal, then the ADVs will SHUT and TBVs control RCS at a lower temperature band around 505 °F .

67. During the performance of a routine valve lineup while the Unit is in Mode 5, a valve listed as OPEN is discovered to be closed.

Which one of the following describes the correct action to be taken for this valve lineup condition?

- A. Since the Unit is not in MODE 1 or 2, an entry in the CRO log is required.
- B. Note the position on the discrepancy section of the lineup cover sheet and have the designated SRO evaluate the discrepancy.
- C. With concurrence of the Control Room Operator, the valve is immediately returned to the recommended position.
- D. An Abnormal Valve position tag is attached to the valve and the step is signed off as complete.

68. You are an extra SRO on-shift in the OWC office, when Unit 1 reactor trips. About 30 minutes later a Maintenance Supervisor requests to talk with the SM. The Maintenance Supervisor explains that there is a problem with the final coupling alignment for 12 Condensate pump during its routine overhaul.

Which one of the following describes the proper response to the Maintenance Supervisor's request?

- A. Direct the Maintenance Supervisor to fill out an Issue Report.
- B. Direct the Maintenance Supervisor to enter the Control Room to get permission to see the SM.
- C. Direct the Maintenance Supervisor to fill out a Risk Assessment form.
- D. Direct the Maintenance Supervisor to wait until normal access is restored.

69. You are in the OWC and a NFM Engineer requests operator support for an unscheduled activity to move fuel assemblies into the Fuel inspection stand in the SFP area.

Which one of the following is the proper action for the work request per NO-1-100?

- A. Verify plant conditions are correct for fuel handling, assign a qualified SFHM operator and grant permission for the evolution.
- B. Direct the NFM Engineer to have the activity scheduled on the QSS schedule.
- C. Verify plant conditions are correct for fuel handling, contact CRS for approval and assign a SFHM operator, direct the NFM Engineer to conduct a pre-job brief.
- D. Perform a risk assessment, contact the CRS for approval and SFHM operator assignment, direct the NFM Engineer to conduct a pre-job brief.

70. Given the following:

- * Unit 2 tripped
- * EOP-5 is implemented
- * A loss of all AC power occurs

What is the MAXIMUM design time available to restore power to the affected battery chargers?

- A. 2 hours from initial loss of power
- B. 4 hours from initial loss of power
- C. 6 hours from time of Reactor Trip
- D. 8 hours from time of Reactor Trip

71. Which one of the following describes the basis for the differences in the required Unit 1 (2343 ppm) and Unit 2 (2323 ppm) refueling boron concentrations per Tech Spec 3.9.1?

- A. Boron¹⁰ atom % concentration is greater on Unit 1 than Unit 2.
- B. Unit 1 has higher U²³⁵ enrichment fuel load than Unit 2.
- C. Unit 2 has higher U²³⁵ enrichment fuel load than Unit 1.
- D. Pu²³⁹ concentration is greater on Unit 2 than Unit 1.

72. Refer to the attached Unit 1 Technical Specifications Core Operating Limits Report (COLR).

Unit 1 reactor power is 80% when a continuous CEA withdrawal occurs. When the withdrawal is stopped, indicated Axial Shape Index (ASI) is -0.25 and reactor power peaks at 85%. Unit 1 is using Excore Monitoring for LHR and DNB surveillance monitoring.

Which, if any, axial flux offset control limit(s) is(are) being exceeded?

- A. Linear Heat Rate only.
- B. DNB only.
- C. Both Linear Heat Rate and DNB.
- D. Neither Linear Heat Rate nor DNB .

73. Given the following:

- * An approved Waste Gas Release Permit has been issued
- * ABO is lining up to discharge 11 WGDT
- * CRO has completed a RMS operability check on O-RI-2191 per OI-17B and notes that the applicable recorder is not functioning

Which one of the following is the required action for the stated conditions?

- A. Stop the evolution and contact Instrument Maintenance for priority repair of the recorder prior to the release.
- B. Continue with evolution and notify Chemistry to determine alternate monitoring requirements per the ODCM.
- C. Stop the evolution and contact Chemistry to determine operability of the RMS per the ODCM.
- D. Continue with the evolution since the recorder is not required by the ODCM for operability.

74. Given the following:

- * Unit 1 is at 50% power
- * Maintenance is in progress on 11 Charging pump
- * alarm at 1C17 "RAD MON PANEL 1C22" annunciates
- * CRO reports that "UNIT 1 WP VENT" alarmed with 1-RI-5410 reading 1000 cpm
- * ABO reports that 11 Charging pump was inadvertently vented

As CRS, select the proper response to these conditions:

- A. Direct CRO to remove the monitor from service until completion of maintenance on 11 Charging pump.
- B. Declare 1-RI-5410 OOS due to alarm setpoint set too low, have CRO refer to Alarm Manual for compensatory actions.
- C. Direct CRO bypass 1-RI-5410 alarm for duration of maintenance on 11 Charging pump.
- D. Direct CRO to notify Rad Safety, ABO and Shift Manager of alarm condition and monitor for trends on 1-RI-5410.

75. Using appropriate references:

Given the following:

- * Unit 1 is at 100% power
- * A Loss of Offsite Power occurs and 1A and 1B DGs failed to load
- * After EOP 0 is complete, the appropriate optimal procedure is implemented on Unit 1
- * The appropriate ERPIP EAL is declared after 15 minutes and notification is completed.
- * ~10 minutes later, 11 4KV Bus is repowered by the 0C DG

Assuming you are the SM, which one of the following describes the ERPIP EAL based on the above conditions?

- A. Unusual Event.
- B. Alert.
- C. Site Emergency.
- D. General Emergency.

76. One of the major set of actions performed during EOP-5 (LOCA), is to commence a cooldown to SDC entry conditions.

Which of the following is the basis for this action, during a small break LOCA?

- A. Ensure SDC is entered before condensate inventory is lost using TBVs.
- B. Minimize the time before corrective maintenance activities can commence.
- C. Enhance natural circ, if RCPs are secured, and depressurize the RCS faster to allow quicker inventory recovery.
- D. Allow operation of the LPSI pumps under RAS conditions.

77. The Control Room has been evacuated due to toxic gas intrusion per AOP-11 (Control Room Evacuation and Safe Shutdown, Non-fire conditions). The STA reports that the Safety Parameter Acceptance Criteria for Core and RCS Heat Removal can not be met due to no RCPs operating. All other parameters are met.

Based on the NO-1-200 requirements for not meeting AOP SFSC criteria, the correct action would be:

- A. Start one RCP in each loop, per AOP-11, for decay heat removal.
- B. Start both RCPs in the loop with an available SG, per AOP-11, for decay heat removal.
- C. Implement EOP-8 after the Control Room atmosphere allows entry for RCP restart.
- D. Implement EOP-8, since AOP-11 assumes at least two RCPs are running.

78. Given the following:

- * Unit 2 steam line rupture event is in progress
- * EOP 4 has been implemented and STEP G has identified 21 SG as the affected SG
- * The CRO reports that the TBO states that 21 ADV Hand valves are frozen in POSITION 1

Which one of the following actions is correct per EOP-4?

- A. Direct the CRO to place the ADV controller at 2C03 in MANUAL with 0% output.
- B. Direct the CRO to have the ABO SHUT 2-MS-101, 21 ADV Isolation.
- C. Direct the CRO to place the 21 ADV Controller 2-HC-4056A to 0% output.
- D. Direct the CRO complete the rest of STEP G and write an IR on the hand valves.

79. Given the following:

- * Both Units are at 100% power
- * A fire is reported in the -15 foot East-West Corridor and the Fire Brigade responds
- * The OTA reports fire damage appears severe and safe shutdown equipment is damaged with heavy smoke in the area

Which one of the following describes the proper actions for the given plant conditions?

- A. Monitor communications with the Fire Brigade, secure Auxiliary Building elevator to prevent use during fire.
- B. Call for outside assistance from local fire companies within 15 minutes, review Tech Specs and TRM for system applicability.
- C. Trip the affected Unit(s), implement EOP 0 on the affected Unit(s), cooldown the affected Unit(s) to Mode 5 within 72 hours to comply with Appendix R requirements.
- D. Implement AOP 9C to Trip both Reactors and Main Turbines, secure SGFPs and CEDM MG sets.

80. Which one of the following describes the immediate effect on Shutdown Margin as defined by Tech Specs for a dropped CEA?

- A. Shutdown Margin is unchanged by the dropped CEA.
- B. Shutdown Margin is reduced by the worth of the CEA.
- C. Shutdown Margin is increased by the worth of resultant power change.
- D. Shutdown Margin is unchanged because of the offsetting Xe reactivity effects.

81. On a loss of MCC-214, which boration flowpath would be available?

- A. RWT outlet and a charging pump.
- B. 22 BA pump, BA direct M/U valve and a charging pump.
- C. 21 BA pump, BA flow control valve, VCT to a charging pump.
- D. 21 or 22 BAST gravity valves and a charging pump

82. Given the following:

- * Unit 2 is in Mode 6 with RFP level at 67 foot elevation
- * RCS level has been slowly rising over the last twelve hours
- * Chemistry reports RCS sample results show boron has decreased from 2610 ppm to 2583 ppm and Hydrazine is at 10 ppm

Which of the following is the correct action, per the applicable AOP?

- A. Borate with 3 charging pumps to maintain specified boron concentration.
- B. Drain the RCS as required.
- C. Lower SG levels.
- D. Drain the RCS as required and monitor for SG tube primary side draining.

83. Given the following:

- * Unit 1 trips due to a LOOP
- * 1A and 1B DGs fail to start
- * The appropriate optimum procedure is implemented
- * The CRO has completed actions to align the electrical system for power restoration
- * 1-CC-3832-CV (CC CNTMT SUPPLY) is shut

Which of the following is the reason for shutting 1-CC-3832-CV?

- A. Prevent DG overload when a Component Cooling pump is restarted.
- B. Prevent thermal shock to RCP seals when CC pump(s) are started.
- C. Maximize the heat removal capability of the CCHX for SDC entry conditions.
- D. Minimize the DG loading during a SBO.

84. Given the following:

- * EOP 5 is implemented on Unit 1
- * 11 4KV Bus is deenergized
- * RAS has actuated
- * HPSI pump is cavitating and flow cannot be throttled

Which one of the following is required action to maintain adequate heat removal?

- A. Align 11 CS pump flow to 12 HPSI pump via 11 SDC HX to HPSI pump suction valve, SI-663-MOV.
- B. Align 12 CS pump flow to 13 HPSI pump via 12 SDC HX to HPSI pump suction valve, SI-662-MOV.
- C. Align 12 CS pump flow to 12 HPSI pump via 11 SDC HX to HPSI pump suction valve, SI-663-MOV.
- D. Align 11 CS pump to 13 HPSI pump via 12 SDC HX to HPSI pump suction valve, SI-662-MOV.

85. Given the following:

- * Unit 1 is at 100%
- * A major transient results in an increasing RCS pressure trend
- * The RO reports that Quench Tank parameters are increasing and acoustic monitors indicate a large leak rate into the quench tank
- * The Reactor automatically trips at 2400 PSIA RCS pressure
- * RCS pressure stops increasing and starts rapidly decreasing
- * The plant computer indications are:
 - T106 (Pwr Op Relief Valve Out) - 110° F
 - T107 (Pzr Relief Valve Temp Out) - 285° F
 - T108 (Pzr Relief Valve Temp Out) - 100° F

Which of the following describes the event diagnosis and associated procedure for taking action?

- A. Single ejected CEA event and EOP-8.
- B. Uncomplicated Loss of Load event and EOP -1.
- C. Single failed open PORV event and AOP-2A (Excessive Reactor Coolant Leakage).
- D. Single failed open RCS Safety Valve event and EOP-5.

86. Given the following:

- * Unit 1 is in Mode 5
- * SDC is in service with 11 LPSI pump running
- * RCS temperature is 180 °F
- * Pressurizer Proportional and Backup heaters are placed in AUTO
- * RCS pressure peaks ~300 PSIA
- * The RO reports that pressurizer level is decreasing

Which one of the following describes the correct procedure to implement and probable reason?

- A. Implement AOP 2A, Excessive RCS Leakage, for loss of RCS inventory due to SDC return header relief valve open.
- B. Implement AOP 3B, Abnormal Shutdown Cooling Conditions, for loss of RCS inventory due to SDC return header relief open.
- C. Implement AOP 2A, Excessive RCS Leakage, for loss of RCS inventory due to NRHX tube leakage.
- D. Implement AOP 3B, Abnormal Shutdown Cooling Conditions, for loss of RCS inventory due to NRHX tube leakage.

87. Given the following:

- * "11,12 125V DC BUS U/V" alarm is annunciated at 1C34
- * The CRO reports "0" voltage indication for 11 125 V DC Bus

Which one of the following describes the expected effect on Unit 1 and 2?

- A. Unit 1 will trip after 30 second delay, Unit 2 will not automatically trip.
- B. Unit 2 will trip after a 30 second delay, Unit 1 will not automatically trip.
- C. Unit 1 and 2 will trip after 30 second delay.
- D. Unit 1 and 2 will not automatically trip.

88. Given the following:

- * Unit 2 is in Mode 2, EOL and at ~2% Reactor power with Main Turbine tripped
- * 21 SGFP running with 22 SGFP lined up in STBY
- * AFW system aligned for normal operation
- * The RO reports that Tc is lowering, approaching 515 °F Tavg
- * RO withdrew Reg Group 5 CEAs from 125 inches to 133 inches before being stopped by the SM
- * The CRO reports that 21 SGFP overspeed and tripped on high discharge pressure
- * Shortly thereafter, the RO reports Unit 2 is in Mode 1 with .5 DPM SUR

As the CRS, describe the action(s) required and basis for the decision:

- A. Direct the insertion of Reg Group 5 to return to Mode 2, start up 22 SGFP.
- B. Direct a reactor trip due to positive reactivity excursion from excessive CEA motion.
- C. Direct the insertion of Reg Group 5 to maintain power at 5%, start 23 AFW Pump.
- D. Direct a reactor trip due to a positive reactivity excursion from excessive cooldown.

89. Given the following:

- Unit 2 is at 100% power
- Unidentified RCS leakage is .9 GPM
- No SG leakage is identified
- RO reports that VCT trace indicates an increase in RCS leakage

As the CRS, you direct the implementation of AOP 2A (Excessive RCS leakage).

Which of the following conditions would require Unit 2 to be shutdown per T.S. 3.4.6.2?

- A. 10 GPM leakage from body to bonnet gasket leak on 2-CVC-515 (Letdown Stop).
- B. 10 GPM leakage from seat leakage from PORV-404.
- C. 10 GPM leakage from RCP integral heat exchanger.
- D. 10 GPM leakage from packing gland leakage on SI-652-MOV.

90. Given the following:

- * Loss of Offsite Power occurs
- * EOP-2 is implemented on both Units
- * All DGs start and load as designed

Which one of the following prevents a DG overload condition, should the LOCI sequencer initiate?

- A. Shifting vital bus loads to SMECO, per EOP-2.
- B. Maintaining load on 1A DG less than 1 MW, by stopping non-essential loads per EOP-2.
- C. Controlling load on 1B DG, by starting non-essential loads per EOP-2 .
- D. Placing the 0C DG on 21 4KV bus, per EOP-2.

91. Given the following:

- * Unit 1 is in Mode 6
- * Core on-load is in progress
- * RFM is over the upender lowering the hoist to grapple a "SHINY" Assembly
- * The RFM operator observes a high radiation alarm on the portable radiation monitor on the RFM Bridge

Which one of the following describes FHS direction required for the stated conditions?

- A. Implement AOP 6D, Fuel Handling Incident, and direct personnel to evacuate the Containment, and send the irradiated fuel to the Spent Fuel Pool side.
- B. Validate the radiation alarm then implement AOP 6D, Fuel Handling Incident and direct personnel to evacuate the containment.
- C. Implement AOP 6D, Fuel Handling Incident, and direct the RFM operator to move the RFM to allow the transfer carriage to be sent to the Spent Fuel Pool side.
- D. Validate the radiation alarm then implement AOP 6D, Fuel Handling Incident and direct personnel to evacuate the Spent Fuel Pool and Containment.

92. Given the following:

- * Unit 1 is in Mode 1
- * "125 VDC GROUND DETECTED" alarm is received at 1C33
- * The ground detection system indicates a partial positive ground on 21 125 VDC Bus Panel 1D15
- * E-shop reports that a partial ground has been identified to 1-CC-3833-SV coil

Which one of the following describes the required action based on the potential impact of the ground if it is not isolated?

- A. Implement AOP 7J for loss of 21 125 VDC Bus.
- B. Implement AOP 7C for loss of RCP component cooling water.
- C. Direct the CRO to perform STP O-68-1 to determine the operability of position indication for 1-CC-3833-CV.
- D. Direct the CRO to perform a stroke test with STP O-66D-1 to determine the operability of 1-CC-3833-CV.

93. Unit 2 is in Mode 4 and heating up when the RO reports that Containment average air is 100 °F with the following parameters:

- * 21, 22 and 23 Containment Air Coolers are running in SLOW speed
- * SRW flow to the CACs is in the normal lineup (8" SRW Valves are SHUT)

Which one of the following describes the direction the CRS should give the CRO to operate the CACs based on the normal system operation per OI-5A?

- A. OPEN the 8" SRW Emergency Outlet CVs.
- B. SHIFT running CACs to FAST speed.
- C. START 24 CAC in SLOW speed
- D. RUN all 4 CACs in FAST speed.

94. Which one of the following is the basis for the CCNPP IPE (PRA) determining that the concurrent loss of 1Y03 and 1Y04 could result in a significant Core damage probability?

- A. AFAS Block would stop AFW flow, DG will not start and PORVs are OPEN from RPS response.
- B. DGs would fail to start, vital 4KV Busses would be de-energized and PORVs are OPEN by RPS response.
- C. DGs would start and power vital 4 KV Busses, ESFAS pumps would NOT start due to deenergized LOCI sequencer and PORVS would be OPEN by RPS response.
- D. AFAS Block would stop AFW flow, ESFAS pumps would NOT start due to UV Blocked signals and PORVs would be OPEN by RPS response.

95. Using provided references:

Given the following:

- * Unit 2 has tripped and EOP 5 (LOCA) has been implemented 4 hours ago
- * RCS pressure has equalized with Containment pressure at 45 PSIG
- * CET average temperature is 352 °F
- * RAS has actuated and HPSI flow has been throttled to 300 GPM

Which one of the following is the correct actions to mitigate core damage?

- A. Line up and start Core Flush via Pressurizer injection.
- B. Increase LPSI flow.
- C. Increase HPSI flow.
- D. Commence RCS cooldown to below 300 °F using TBVs or ADVs.

96. Given the following:

- * Unit 2 is at 95% and returning to 100% power
- * The CRO reports a rapid lowering of hotwell level with a low pressure alarm on the Condensate header

Which one of the following is the correct response for the conditions?

- A. Direct the RO to trip the reactor, perform Reactivity Control per EOP-0, then direct the CRO to trip both SGFPs, secure CBPs, HDPs and Cond pumps, shut SG FW ISOL valves, start AFW system per AOP 3G, implement the remainder of EOP-0.
- B. Direct the CRO to shut the hotwell dump valve, verify condensate header pressure returns to normal per the Alarm Manual.
- C. Direct the RO to trip the reactor, and the CRO while performing Core and RCS Heat Removal to start of the idle Condensate Booster pump, verify the condensate header pressure returns to normal per EOP-0.
- D. Direct the CRO to take manual control of the hotwell level controller, place to controller at 50 % and verify condensate header pressure returns to normal per Alarm Manual.

97. Given the following:

- * Unit 2 is in Mode 5 at reduced inventory
- * Equipment Hatch is installed with 4 bolts
- * PAL interlocks are defeated with doors shut and a Guard is stationed to operate the doors
- * A Modified Containment Purge (Supply fan OFF, Exhaust fan ON) is in progress
- * SFHM is tagged out for replacement

Which one of the following describes a safety issue based on the stated conditions?

- A. Opening PAL Outer Door with the Inner Door open.
- B. Securing the SFP Ventilation System.
- C. Shutting PAL Outer Door with the Inner Door shut.
- D. Starting up the SFP Ventilation System

98. Given the following:

- * Unit 2 is at 100% power
- * RRS Control Channel X upper and lower detectors fail low

Which one of the following procedures describes the actions to mitigate the impact of this failure?

- A. OI-7 (Reactor Regulating System)
- B. OI-12A (Feedwater System)
- C. REP-03 (Internal Vibration Monitoring System)
- D. AOP -7H (Loss of Plant Computer; for the Power Ratio Calculator)

99. Unit 1 is at 100%, when two CEAs in Regulating Group 5 are determined by the System Engineer to have stuck grippers based on CEA traces.

Which one of the following is the appropriate action, per procedures?

- A. Verify Regulating Group CEA Insertion limits within 1 hour; Trip the reactor, per AOP 1B, to ensure proper Shut Down Margin.
- B. Return at least one CEA to operable status within 1 hour or Trip the reactor per AOP 1B to enter Mode 3 to be outside the mode of applicability.
- C. Be in Mode 3 within 6 hours by commencing a rapid shutdown, per OP-3, and borate until RCS is >2300 PPM, to ensure proper Shut Down Margin
- D. Verify Regulating Group CEA Insertion limits within 1 hour; commence a rapid shutdown, per OP-3, to be outside the Mode of applicability within 12 hours.

100. Given the following:

- * Specific activity of the reactor coolant has exceeded 1.0 microcurie/gram DOSE EQUIVALENT I-131 for greater than 100 continuous hours interval.

Which one of following is the basis for the requirement to cooldown below 500 °F within 6 hours?

- A. Prevents the release of activity should a SG tube rupture occur.
- B. Increases reliability of the data collected for actual Iodine determination per ODCM.
- C. Minimizes the expected Iodine spiking phenomena from the large change in thermal power due to plant shutdown.
- D. Increases the coolant density to enable self-shielding to reduce on-site exposures.

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QUESTIONS 101 THROUGH 250 CONTINUE ON THE OTHER SIDE

Attachment 2

RO WRITTEN EXAM W/ANSWER KEY

**U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination**

Applicant Information

Name:	Region: <u>IV</u> / II / III / IV
Date: <u>9/22/00</u>	Facility/Unit: <u>CCNPP 1&2</u>
License Level: <u>RO</u> / SRO	Reactor Type: W / <u>CE</u> / BW / GE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

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

Applicant's Signature

Results

Examination Value	<u>100</u> Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

Name: _____

1. The basis for the high limit on RCS Subcooled Margin, in EOP-4, is to prevent PTS (Pressurized Thermal Shock). What is the reason for this limit to lower, as the plant ages?

- A. Work hardening of the Pressurizer Spray Nozzles.
- B. Reduced thermal conductivity of the Reactor Vessel.
- C. Neutron embrittlement of the Reactor Vessel.
- D. Newer, more accurate, metallurgical analysis of the Reactor Vessel Head Bolts.

2. The Unit is at full power. The RO is directed to report to the Shift Manager in his office to discuss a surveillance he recently performed. The CRO is to relieve the RO during the meeting.

Which one of the following describes the minimum action the RO is REQUIRED to perform per NO-1-200 (Control of Shift Activities)?

- A. Verbally brief the CRO.
- B. Walkdown the panels with the CRO.
- C. Inform the CRS of the meeting subject, duration and the location.
- D. Complete all requirements listed in NO-1-207 (Nuclear Operations Shift Turnover).

3. Given the following:

- Unit 1 is defueled and Unit 2 is in Mode 5
- Alarm "SFP TEMP HI" annunciates at 1C13

Select the cooling mechanisms in preferred order per AOP-6F (SFP Cooling Malfunctions):

- A. Line up Unit 1 SDC to SFP system, place second SFP cooler in service, add makeup to SFP as water boils off.
- B. Place second SFP cooler in service, line up Unit 1 SDC to SFP system, add makeup to SFP as water boils off.
- C. Line up Unit 2 SDC to SFP system, place second SFP cooler in service, add makeup to SFP as water boils off.
- D. Place second SFP cooler in service, line up Unit 2 SDC to SFP system, add makeup to SFP as water boils off.

4. A new electric motor has been installed on an existing pump. The MO requires the motor to be checked for proper rotation and not all clearances have been returned.

Which one of the following actions are required to remove the Danger Tag from the motor power supply? (assume the pump suction and discharge valves are to remain tagged out)

- A. Process a Supplementary Clearance.
- B. Process a modification to the tagout.
- C. Clear all tags and use a "human danger tag" for equipment not ready for operation.
- D. Verbally authorize the "lifting" of the motor tag and re-tag after rotation check.

5. Which one of the following is the LTOP protection applicability requirements per Tech Specs for Unit 1 and Unit 2?

- A. Mode 3 with Unit 1 RCS cold leg temperature <365 °F or Unit 2 RCS cold leg temperature <301 °F.
- B. Mode 3 with Unit 1 RCS cold leg temperature <301 °F or Unit 2 RCS cold leg temperature <365 °F.
- C. Mode 3 with Unit 1 RCS cold leg temperature <365 °F or Unit 2 RCS cold leg temperature <301 °F AND Modes 4, 5, 6.
- D. Mode 3 with Unit 1 RCS cold leg temperature <301 °F or Unit 2 RCS cold leg temperature <365 °F AND Modes 4, 5, 6.

6. An operator is assigned a task to monitor a resin transfer line for blockage. The operator's current dose for the year is 1200 mrem. The task is expected to result in a dose of 100 mrem.

Describe the procedure, if required, for extending the administrative dose limit:

- A. No administrative dose limit extension is needed.
- B. Dosimeter record review, Shift Manager and GS-NO approvals.
- C. Dosimeter record review, GS-NO and GS-RS approvals.
- D. EPD functional review, RadCon S/S and Shift Manager approvals.

7. Given the following:

- * Unit 2 is in Mode 5
- * PAL interlocks are defeated
- * Containment Equipment hatch is installed
- * Spent fuel moves are in progress in the SFP area

Which one of the following describes the condition required to maintain operability of SFP ventilation?

- A. Line-up Containment Purge with Supply fan OFF and Exhaust Fan ON.
- B. Containment Equipment Hatch must be secured with all bolts.
- C. Line-up Containment Purge with both the Supply and Exhaust fans ON.
- D. Containment Equipment Hatch must be secured with at least 4 bolts.

8. Which one of the following describes the proper action(s) for a reactor trip and a subsequent severe fire requiring a Control Room Evacuation?

- A. Implement EOP-0.
- B. Implement AOP-9A.
- C. Implement EOP-0, then return to AOP-9A.
- D. Parallel implement EOP-0 and AOP-9A.

9. During the performance of EOP-0, the RO observes the following plant conditions for the Pressure and Inventory Safety Function:

- * Pzr level is at 70 inches and steady
- * 3 Charging pumps are running
- * Letdown was isolated prior to the reactor trip
- * RCS pressure is 1900 PSIA and steady
- * RCS Subcooling is 95 °F and steady

The FINAL report from the RO to the CRS regarding the status of Pressure and Inventory Control Safety Function should be:

- A. COMPLETE.
- B. MONITORING.
- C. CANNOT BE MET.
- D. TAKING ALTERNATE ACTIONS.

10. Given the following:

- * Unit 2 Reactor was manually tripped from 100% power due to a loss of a SGFP
- * RCS boron concentration at 753 ppm
- * The RO observes that 1 CEA has a WHITE light only

Which of the following is the proper response to complete the Reactivity Safety function steps?

- A. Monitor for drop in reactor power, a negative SUR and borate to at least 1053 ppm.
- B. Monitor for drop in reactor power, a negative SUR , inform the CRS that Reactivity Control Safety Function can not be met.
- C. Monitor for drop in reactor power, a negative SUR, verify DI water to the RCS is secured.
- D. Monitor for drop in reactor power, a negative SUR and borate to at least 2300 ppm.

11. Given the following:

- * Both Units are at 100% power
- * 1C01 "ANN LOSS OF DC POWER" annunciator alarms
- * ERPIP is implemented and an UNUSUAL EVENT is declared

Which one of the following describes the Alarm Manual actions required of the RO?

- A. Assemble with the Control Room personnel for accountability.
- B. Assume the duties of the Control Room Communicator.
- C. Monitor plant computer trends and raise frequency of watchstation rounds.
- D. Assume the duties of NRC ENS Communicator.

12. Given the following:

- * Unit 1 120VAC bus 1Y01 has been lost.
- * Operators are directed by AOP-7J (Loss of 120 Vital AC Power) to stop the Containment Radiation Monitor pump.

Which one of the following is the reason for securing the pump?

- A. To prevent an inadvertent restart of the pump when the bus is repowered .
- B. To avoid reliance on the low flow trip to protect the pump.
- C. To prevent an inadvertent alarm when the bus is repowered .
- D. To establish containment integrity for the affected penetration.

13. During the heat up of Unit 2 from Mode 5, when the Unit reaches NOT and NOP, the RO reports 22B RCP temperature trends have slowly increased during the heatup of the RCS, and are consistently running higher than the other RCPs.

Which one of the following is the correct action to respond to the 22B RCP temperature trend?

- A. Verify CC 3832 and 3833 open.
- B. Start a second CC pump.
- C. Check CC flow to 22B RCP ~ 50 GPM higher than the other RCPs.
- D. Check RCP integral heat exchanger for leakage.

14. What CRO action must be taken on Unit 2 in the "Ensure Turbine Trip" block step to prevent an overcooling of the RCS, per EOP-0? (The Turbine Speed was observed to be decreasing)

- A. Press "Close Valves" button on the turbine control panel.
- B. Press "Reset" button on the MSR control panel.
- C. Observe that MSR source valves go shut.
- D. Shut both MSIVs.

15. One of the first actions the operator is instructed to take per AOP-6A (Abnormal Reactor Coolant Chemistry/Activity) on increased RCS activity is to adjust letdown flow.

Which one of the following statements is correct as to the adjustment and the reason?

- A. Increase letdown to maximum to divert RCS water for processing by the RCW Processing System.
- B. Decrease letdown to minimum to minimize the amount of radioactive letdown that is flowing throughout the Auxiliary Building.
- C. Isolate letdown until the cause of the activity increase can be determined by chemistry technicians.
- D. Increase letdown flow to obtain the maximum purification flow.

16. Following a Loss of Offsite Power, natural circulation flow can not be accurately verified for approximately 15 minutes.

Which one of the following is the cause of this time delay?

- A. Time for Reactor Coolant Pump coastdown.
- B. Formation of Steam Generator inverted delta T.
- C. Time for Low Steam Generator levels recovery.
- D. Increased loop cycle time.

17. Given the following:

- * Unit 1 is in Mode 3 at NOT and NOP
- * A total loss of Component Cooling occurs
- * AOP-7C (Loss of Component Cooling Water) is implemented and RCPs are stopped
- * All RCP lower seal temperatures are < 250 °F
- * The CRS directs the start of 12 CC pump per AOP-7C

Which of the following is the correct valve lineup for RCP restart after completion of AOP-7C actions?

- A. SHUT 1-CC-3832-CV (CC CNTMT SUPPLY) valve prior to RCP restart.
- B. SHUT 1-CC-284 (CC CNTMT SUPPLY HDR ISOL) prior to RCP restart.
- C. OPEN 1-CC-3832-CV (CC CNTMT SUPPLY) valve prior to RCP restart.
- D. OPEN 1-CC-284 (CC CNTMT SUPPLY HDR ISOL) prior to RCP restart.

18. Given the following:

- * Unit 1 is in Mode 3 preparing for RCS cooldown to Mode 5
- * The CRO reports that 1C13 panel indication 11 Salt Water header pressure is reading 9 PSIG and both the salt water flow on the 11 SW header and 11 CCHX have increased

Which one of the following describes the required actions based on plant conditions?

- A. Implement AOP 7A (Loss of Saltwater Cooling) and reduce 11 Salt Water header flow by placing 11A/11B SRWHX SW Bypass, 1-PIC-5154, in AUTO.
- B. Implement AOP 7A (Loss of Saltwater Cooling) for a rupture on the 11 CC Heat Exchanger header.
- C. Direct the OSO to throttle 11 SW pump discharge to raise SW header pressure per OI-29 (Saltwater System).
- D. Start 13 SW pump on 11 SW header to raise SW header pressure per OI-29 (Saltwater System).

19. Given:

- * Both Units 1 & 2 were at 100% power
- * A Loss of Offsite Power occurred
- * All DGs started and loaded as expected
- * EOP-0 was implemented for both units
- * Condenser vacuum is 22" HG on both Units

What is the correct steam dumping capability of each Unit:

- A. Unit 1 TBVs are operable, Unit 2 TBVs are operable.
- B. Unit 1 TBVs are inoperable, Unit 2 TBVs are operable
- C. Unit 1 TBVs are inoperable, Unit 2 TBVs are inoperable.
- D. Unit 1 TBVs are operable, Unit 2 TBVs are inoperable

20. Given the following:

- * Unit 1 is in Mode 6 with refueling in progress
- * The Containment Outage Door is shut
- * The PPO reports the Equipment Hatch has 1 out of 4 bolts loose
- * AOP-4A (Loss of Containment Integrity) is implemented

Determine the actions required based on plant conditions:

- A. Verify the Containment Outer Door is secured per NO-1-114, Containment Closure
- B. Secure Core Alterations immediately and establish Containment Closure per STP O-55A-1.
- C. Verify the Containment Outer Door is secured per STP O-55A-1 and suspend Core Alterations if unsat.
- D. Secure Core Alterations immediately and document the Containment Closure deviation per NO-1-114.

21. Given the following:

- * Both Units are at 100% power when a Loss of Offsite Power event occurs
- * EOP 0 is implemented on both Units
- * Concurrent with EOP 0 implementation, a loss of suction on the AFW common suction header occurs in the Unit 1 Turbine Building
- * The appropriate optimal recovery procedure is implemented for each Unit
- * The following parameters are observed:

	Unit 1	Unit 2
RCS pressure	1800 PSIA and lowering	1900 PSIA and rising
RCS Tc (~15 min later)	475 °F and lowering	505 °F (after rising uncontrollably from 495 °F)
11 (21) SG level	-360 inches	-300 inches
12 (22) SG level	-300 inches	-300 inches

AFW Suction header is restored after venting

Evaluate the proper actions to be taken on both Units based on stated plant conditions:

- Establish AFW flow on Unit 1 and Unit 2.
- Initiate OTCC on Unit 1 and throttle OPEN ADVs on Unit 2.
- Establish AFW flow on Unit 1 and initiate OTCC on Unit 2.
- Initiate OTCC on Unit 1 and increase AFW flow to Unit 2.

22. Given the following:

- * Unit 2 is at 100% power
- * All control systems are in automatic
- * Pressurizer Spray is stuck open
- * NO operator action is taken

Which one of the following describes the effect of RCS pressure DECREASING to 2205 PSIA?

- Pressurizer "PZR CH 100 PRESS" alarm is annunciated.
- Proportional heaters are fully energized.
- Proportional heaters are partially energized.
- All Backup heaters are energized.

23. Unit 1 is in MODE 3 with Tavg at 532°F, when one CEA is declared inoperable/untrippable. How long after the detection of the inoperable CEA must the shutdown margin be verified?

- Immediately
- 1 hour
- 12 hours
- 24 hours

24. Given the appropriate reference:

During a reactor startup, an unborated ion exchanger was inadvertently placed in service, resulting in RCS boron dilution. If the equivalent dilution flow rate of this ion exchanger is 35 gpm and RCS boron concentration is 993 ppm, how long will it take to reach the boron concentration of 985 ppm?

- A. 13 minutes
- B. 38 minutes
- C. 68 minutes
- D. 100 minutes

25. EOP-7 (Station Blackout) occurred on U-1 and the crew restored power to 11 4KV Bus, from the 1A DG. The CRS directs you to restore power to MCC-104 from MCC-114.

This action will restore power to which of the following equipment?

- A. All Pzr Backup Heater groups and allow all charging pumps to start.
- B. PORV Block Valves and RPS Channel A Instrumentation.
- C. All CEA position indications and Main HPSI header MOVs.
- D. TBV control from 1C03 and Containment Cooling Supply/Return CVs to the RCPs.

26. Given the following:

- * Both Units are at 100% power
- * A severe fire occurs in the Control Room resulting in implementation of AOP-9A (Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire)
- * The required actions of AOP-9A have been performed prior to Control Room evacuation

Which one of the following describes the initial response of RCS temperature upon abandoning the Control Room?

- A. RCS temperature will be controlled at 515 °F - 535 ° by TBVs.
- B. RCS temperature will be controlled at 515 °F - 535 ° by ADVs.
- C. RCS temperature will be controlled by cycling MSSVs.
- D. RCS temperature will be controlled by ADVs at 1C43.

27. A discharge of the Miscellaneous Waste Monitor Tank is in progress.

Which one of the following conditions would require entry into AOP-6B (Accidental Release of Radioactive Liquid Waste)?

- A. Trip of a Circ Water Pump on the unit receiving the discharge with no corresponding reduction in discharge flow rate.
- B. Liquid Waste Discharge valves 2201-CV and 2202-CV OPEN with discharge RMS alarm.
- C. Discharge activity exceeds the computer alarm high setpoint specified in the release permit.
- D. Discharge activity decreases to less than the Discharge Permit background activity value.

28. Given the following:

- * CEA 1 drops to the bottom on Unit 1
- * AOP-1B (CEA Malfunction) is implemented
- * Reactor power is being maintained constant during the recovery of the CEA

Which one of the following is a method used to maintain reactor power?

- A. Adjust Turbine load to compensate for the reactivity effects of CEA withdrawal.
- B. Fast Borate to compensate for the reactivity effects of the CEA withdrawal.
- C. Insert Group 1 CEAs to compensate for the reactivity effects of the CEA withdrawal.
- D. Dilute RCS to compensate for the reactivity effects of the CEA withdrawal.

29. Given the following:

- * A transient occurs on Unit 1
- * EOP-0 is implemented and alternate actions are required to trip the reactor
- * All Safety Functions are complete

Which one of the following breakers would be reclosed after actions to trip the reactor?

- A. 11A 480V normal feeder breaker and 12A 480V tie breakers are closed.
- B. 12A 480V and 13A 480V normal feeder breakers are closed.
- C. 12A 480V and 13B 480V normal feeder breakers are closed.
- D. 12B 480V and 13A 480V normal feeder breakers are closed.

30. Given the following:

- * Unit 1 is in Mode 2 and at the POAH
- * The RO withdraws CEA Regulating Group 4 to raise power and enter Mode 1
- * After the RO releases the Raise/Lower Switch, he observes a steady rise in Reactor power and RCS temperature
- * Primary CEA Group 4 selected light is indicating withdrawal

Which one of the following describes the required action per AOP-1B?

- A. Insert CEAs to initial position to stop the power increase at the desired point in mode 1.
- B. Place the Raise/Lower Switch to LOWER and monitor CEA position indications for Regulating Group 4.
- C. Trip the Reactor and implement EOP-0.
- D. Place the CEDS system in OFF and monitor CEA position indications for Regulating Group 4.

31. In accordance with the basis document, which of the following is the reason for tripping 2 RCPs at 1725 psia and the last 2 RCPs when RCS temperature/pressure are less than minimum RCP operating limits during a LOCA?

- A. Minimize pump cavitation and/or air binding which would result in pump/motor damage.
- B. Minimize the loss of RCS inventory during a break at the bottom of the hot leg.
- C. Minimize the loss of RCS inventory during a break at the bottom of the cold leg.
- D. Minimize the heat input from the pumps thereby minimizing core damage.

32. Which condition occurs on a loss of +15 VDC power to the W.R. flux trip relays 1 & 2?

- A. SUR trip inhibited.
- B. Zero power mode bypass enabled.
- C. CEAPDS PDIL enabled.
- D. TM/LP signal to CWP inhibited.

33. A charging header leak would be identified by which one of the following?

- A. Lowering pressurizer level with minimum letdown flow and one charging pump operating.
- B. Charging header pressure greater than RCS pressure with two charging pumps operating.
- C. Charging header flow equals letdown flow with one charging pump operating and VCT level is lowering.
- D. Charging header pressure less than RCS pressure with one charging pump operating.

34. After isolating a S/G that has a ruptured tube, which one of the following is the preferred method for maintaining control of the level in the S/G?

- A. Steaming to the condenser.
- B. Blowdown to the condenser.
- C. Backfill to the RCS.
- D. Blowdown to the MWS.

35. Chemistry reports that the calculated Steam Generator primary-to-secondary leak rate is 50 GPD. The CRS has the appropriate AOP implemented.

Which one of the following describes the actions that are expected?

- A. Secure SG Surface and Bottom Blowdown Valves.
- B. Implement AOP-2A (Excessive Reactor Coolant Leakage) and commence a Plant shutdown.
- C. Monitor SG level for an unexplained rapid increase.
- D. Review AOP-2A (Excessive Reactor Coolant Leakage), EOP-6, EOP-8 and OP-3 Appendix B (Rapid Power Reduction).

36. Given the following:

- * Unit 2 tripped from 100% power
- * EOP-0 "Post Trip Immediate actions" are being performed
- * The Main Turbine did not trip as expected

Which one of the following actions should be performed per EOP-0 to trip/stop the turbine?

- A. Manually close both MSIVs.
- B. Manually stop EHC pumps.
- C. Manually Shut Turbine Throttle Valves using Test pushbuttons.
- D. Locally trip the Turbine from the front standard.

37. Given the following:

- * Unit 2 was manually tripped from 100% power due to a steam leak in the MSIV room
- * EOP-0 is implemented
- * RO reports Reactivity Control cannot be met due to positive SURs
- * All other Safety Functions are met

Determine the appropriate actions for the plant conditions:

- A. Reassess the EOP-0 Safety Functions and implement the optimal recovery procedure.
- B. Implement the alternate actions for Reactivity Control Safety Function to mitigate the ATWS event.
- C. Implement EOP-8 and determine success paths using the Resource Assessment Table.
- D. Implement EOP-4 to address reactivity control and isolate the steam leak.

38. Given the following:

- * Unit 1 is at 100% power
- * 1Y01 (11 120V Vital AC bus) had been deenergized for emergency maintenance and is ready to be energized
- * The CRS directs you to reenergize 1Y01 per OI 26B (120 Volt Vital AC and Computer AC)

Which one of the following describes an expected result from improper implementation of the applicable procedure steps?

- A. ESFAS ZB logic channel could actuate if cabinet is not shutdown per OI-34 prior to energizing 1Y01.
- B. Unit 2 Channel A WRNI at 2C43 Preamplifier may be damaged if power is restored prior to IM discharging the Fission Chamber.
- C. Unit 2 Channel A LRNI at 2C43 Preamplifier may be damaged if power is restored prior to IM discharging the Fission Chamber.
- D. ESFAS ZE sensor channel could trip if cabinet is not shutdown per OI-34 prior to energizing 1Y01.

39. During the performance of a waste gas release from 11 WGDT, WGS-2191-CV is found failed closed by the ABO.

Which valve must be closed promptly per AOP-6C (Accidental Gaseous Waste Release) to prevent an inadvertent release from WG Surge Tank?

- A. WGS-2191-PCV (WG discharge flow control).
- B. WGS-623 (11 WGDT outlet).
- C. WGS-630 (WG discharge final filter bypass).
- D. WGS-683 (WG discharge to unit 1 plant vent).

40. A Generator Core Monitor alarm is received. When the filter pushbutton is depressed, as directed by the Alarm Manual, the indication increases.

What does this mean and why does it happen?

- A. It is an invalid alarm condition. The filter is removing normal impurities in the generator cooling gas.
- B. It is a valid alarm condition. The filter is removing impurities caused by the insulation breakdown within the generator.
- C. It is a valid alarm condition. The filter adds ions to the detector chamber to test instrument response.
- D. It is an invalid alarm condition. The filter is malfunctioning causing detector response to increase.

41. Which one of the following is a condition or indication necessary to ensure adequate RCS cooling flow exists during a large break LOCA per EOP 5?

- A. Indicated Steam Generator water levels are maintained at ~0".
- B. CET temperatures trend consistent with Tcold.
- C. Injection via operating SI pumps per EOP attachment.
- D. RCS subcooling is 50 °F based on CETs.

42. Using the appropriate references and given the following:

- * Unit 2 is in Mode 4
- * RCS is at 500 PSIA and 250 °F
- * The acoustic monitor indicates Safety valve leakage
- * Quench tank temperature is rising and pressure is 15 PSIG

Determine the expected tailpipe temperature and fluid state for the plant conditions:

- A. ~ 250 °F as a saturated vapor.
- B. ~ 330 °F as a saturated vapor.
- C. ~ 250 °F as a superheated vapor.
- D. ~330 °F as a superheated vapor.

43. Given the following:

- * Unit 2 is in Mode 5
- * RCS level is at 38 feet
- * RO observes that 21 LPSI discharge pressure and motor amps are fluctuating
- * "LPSI PUMP SUCTION PRESS LO" alarm is sporadically annunciating
- * SDC flow is observed to be ~3800 GPM and fluctuating

Which one of the following is the appropriate response based on plant conditions:

- A. Adjust SDC flow to 1500 GPM and verify cavitation stops.
- B. Start 22 LPSI pump, stop 21 LPSI pump and verify cavitation stops.
- C. Adjust SDC flow to 3000 GPM and verify cavitation stops.
- D. Secure both LPSI pumps, lineup a CS pump for SDC and verify cavitation stops.

44. Which one of the following is correct concerning a loss of Instrument Air pressure?

- A. Pressurizer Spray Valves fail OPEN.
- B. Condensate Demineralizer Bypass Valve fails OPEN.
- C. Pressurizer Auxiliary Spray Valve fails SHUT.
- D. Containment Spray Control Valves fail SHUT.

45. Given the following:

- * Unit 2 is at 100% power
- * The Regenerative heat exchanger develops a 25 gpm tube leak

Which one of the following describes the effect on letdown flow?

- A. Letdown flow will stop due to CVC-515 auto isolation.
- B. Letdown flow will remain unchanged.
- C. Letdown flow will compensate based on charging pumps status.
- D. Letdown flow will stop due to CVC-516 auto isolation.

46. Which one of the following would be the primary hazard if irradiated fuel were damaged within the pressure vessel during refueling operations?

- A. Inadvertent criticality exposure to personnel in the containment.
- B. Iodine 131 exposure to personnel in the containment.
- C. Chronic gamma radiation exposure to the RFM operator.
- D. Neutron radiation exposure to the RFM operator.

47. Given the following:

- * Unit 1 is at 100% power
- * A LOCA occurs when 1 PORV fails open
- * SIAS and CIS actuate.

Which one of the following describes the initial response of ESF components?

- A. 11 and 12 CS pumps start and CS flow is ~2700 GPM total flow.
- B. 11 and 12 HPSI pumps start and inject water below ~1300 PSIA.
- C. 11 and 12 LPSI pumps start and inject water to the RCS.
- D. 11 and 13 HPSI pumps start and inject water below ~1300 PSIA.

48. Which one of the following is the effect from deenergizing the LRNI level 2 bistable?

- A. Enables APD trip.
- B. Enables Power Trip Test Interlock (PTTI).
- C. Energizes Channel in Test LED.
- D. Enables Loss of Load Trip.

49. Given the following:

- * Unit 1 is in Mode 3 with a reactor startup in progress
- * The RO is withdrawing Regulating Group 1 CEAs in Manual Group mode
- * Regulating Group 1 is at 120 inches
- * No CEA deviations exist

Which one of the following will be the first to automatically stop CEA movement?

- A. Highest CEA reaches the Upper Computer Stop (UCS).
- B. Lowest CEA reaches the Upper Computer Stop (UCS).
- C. Highest CEA reaches the Upper Electrical Limit (UEL).
- D. Lowest CEA reaches the Upper Electrical Limit (UEL).

50. Given the following:

- * Unit 1 is in Mode 5, preparing for RCPs start
- * Unit 2 is in Mode 6
- * 12 13.8 KV Bus voltage is reading 14.8 KV
- * 22 13.8 KV Bus voltage is reading 15.2 KV

Which one of the following is the required action for the plant conditions?

- A. Start Unit 1 RCPs on 12 13.8 KV Bus and verify bus voltage drops to 14.5 KV.
- B. Start Unit 1 RCPs on 22 13.8 KV Bus and shift RCP power to 12 13.8 KV bus when it's voltage increases to ≥ 15.2 KV.
- C. Verify 4 KV Bus voltages are less than 4100 volts and start Unit 1 RCPs on 12 13.8 KV Bus.
- D. Verify 4 KV Bus voltages are greater than 4100 volts and start Unit 1 RCPs on 22 13.8 KV Bus.

51. The CRO is directed to place the AFW speed/flow controllers at 1(2)C43 to the "MIN" position before their respective hand transfer valves are placed in POSITION 2 during AOP-9A (Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire) .

Which one of the following is the reason for the required action?

- A. To remove the air signal to the CVs and allow the CRO to have control of the AFW from 1(2)C43.
- B. To place the AFW pumps at a normal discharge pressure and shut the AFW flow CVs to allow a controlled feed rate.
- C. To place the pumps and CVs in a known position and prevent an uncontrolled RCS cooldown from occurring.
- D. To maintain AFW flow to the SGs to prevent a SG dryout condition until 13 (23) AFW pump is running.

52. Which one of the following describes a design flowpath of the MW Processing System?

- A. MWRT is pumped by the MWRT pump through the MWS filter and IX and IX outlet strainer to 11 RCWMT.
- B. MWMT is pumped by the MWMT pump through the MWS filter and IX and IX outlet strainer to 11 RCWRT.
- C. MWRT is pumped by the MWRT metering pump through the MWS filter and IX to 12 RCWMT.
- D. MWMT is pumped by the MWMT metering pump through the MWS filter and IX to 11 RCWRT.

53. Given the following:

- * Unit 1 is in Mode 5
- * Unit 2 is in Mode 6 with core off-load in progress
- * The Control Room Recirculation Signal (CRRS) is declared inoperable

Which one of the following is the required Tech Spec/TRM action, if any?

- A. Place 1 CREV System train in recirc with Post-LOCI fan in service within 4 hours.
- B. No action required by Tech Spec due to LCO is not applicable for either Unit.
- C. Place 1 CREV System train in recirc with Post-LOCI fan in service immediately.
- D. No action is required by TRM due to condition is not applicable for either Unit.

54. Given the following:

- * Unit 1 is at MOC and 100% power
- * Chemistry requests 13 Purification IX to be placed in service
- * The ABO reports that the "unborated IX" sign is hanging on the inlet valve 1-CVC-146

Which one of the following is the proper response for the plant conditions?

- A. Ensure 1-CVC-520-CV, IX Bypass, is in the BYPASS position and direct the ABO to remove the sign.
- B. Notify the CRS of a possible reactivity change and lower L/D temperature to minimize the effects of the unborated resin.
- C. Ensure 1-CVC-520-CV, IX Bypass, is in the AUTO position and direct the ABO continue placing 13 Purification IX in service.
- D. Notify the CRS of a possible reactivity change due to placing 13 Purification IX in service.

55. The Chemistry Tech has reported to the CRS that the weekly sample of the onservice WGDT has been completed. The analysis results are 4 curies of noble gas and 4.5% O₂ by volume.

What are the required actions for the sample results per TRM?

- A. Isolate the on-service WGDT and prepare a permit for a discharge.
- B. Maintain the on-service WGDT in service, have RCS sampled for activity.
- C. Isolate the on-service WGDT, reduce O₂ concentration in WG system immediately.
- D. Maintain the on-service WGDT in service, monitor letdown process rad monitor.

56. Given the following:

- * Unit 2 was at 100% power when a LOOP and large break LOCA occurred
- * All Emergency Diesels started and loaded as designed

Which one of the following describes the expected configuration of the Containment Cooling Systems?

- A. 4 CACs running in FAST speed and 2 CS pumps are injecting water into the containment atmosphere at > 1400 GPM.
- B. 4 CACs running in SLOW speed and 2 CS pumps are injecting water into the containment atmosphere at ~ 1300 GPM.
- C. 4 CACs running in FAST speed and 2 CS pumps are injecting water into the containment atmosphere at ~ 1300 GPM.
- D. 4 CACs running in SLOW speed and 2 CS pumps are injecting water into the containment atmosphere at > 1400 GPM.

57. Given the following:

- Unit 1 is at 10% power with a Plant startup in progress
- Alarm "12 SG CONTR CH LVL" annunciates at 1C03
- RO reports that 12 SG level by 1-LT-1106 indicates +63.5" and remaining SG level indications are at 0"

Describe the effect on the Plant and action required:

- A. 12 Bypass Feedwater Valve will go SHUT requiring a manual Reactor trip and implementation of EOP-0.
- B. 12 Bypass Feedwater Valve will continue to maintain level, the downcomer selector switch at 1C36 should be placed in the LT-1106 failure position to provide LT-1121 input to the control channel indication.
- C. 12 Bypass Feedwater Valve will go SHUT, requiring manual operation by placing its associated handswitch in the BYPASS FAIL position.
- D. 12 Bypass Feedwater Valve will continue to maintain level, a manual transfer from LOW to HIGH power of the DFWCS will be required for 12 Feed System.

58. Given the following conditions for Unit 1 (Unit 2 is in Mode 5):

- * Reactor tripped 10 minutes ago due to a Loss of Offsite Power (LOOP)
- * RCS is in Hot Standby
- * 12 CST inventory is 150,000 gallons
- * ADVs are maintaining RCS temperature

Which one of the following is the time the AFW system can supply Unit 1 in Hot Standby before cooldown is required per Tech Specs?

- A. 2 hours.
- B. 6 hours.
- C. 8 hours.
- D. 12 hours.

59. Given the following:

- * Unit 1 is at 100% power and EOC
- * ASI indication at 1C05 reads +0.06
- * CEAs are ARO
- * A power reduction is scheduled for MT CV Testing

Which one of the following power reduction methods will minimize the ASI oscillation?

- A. Insert CEAs in 30 inch increments to reduce reactor power.
- B. Fast Borate from the BASTs for 1 minute for each boration addition.
- C. Insert CEAs in ~10 inch increments with 30 second Fast Boration.
- D. Insert CEAs in ~5 inch increments and 10 second Fast Boration.

60. Which one of the following annunciator alarms also indicates the presence of an interlock which will prevent the start of 22A RCP?

- A. "OIL RESVR LEVEL LO"
- B. "OIL LIFT PP PRESS LO"
- C. "CC TEMP HI"
- D. "RCP BLDOFF FLOW HI/LO"

61. Which one of the following conditions would cause an uncontrolled release to the environment that would not pass through any filters contained in the plant ventilation systems?

- A. Resin transfer operation.
- B. Charging pump packing leak.
- C. Waste Gas Surge Tank relief valve open.
- D. Both RC waste degasifiers operating simultaneously.

62. During implementation of EOP-4, the following conditions are noted:

- * 21 SG Bottom Blowdown line ruptures in the Containment
- * EOP-0 actions have been completed and transition to the appropriate optimal recovery procedure has occurred
- * Plant data:
 - RCS pressure is 1000 PSIA
 - RCS cooldown rate is 65 °F per hour
 - 21 SG pressure is 650 PSIA
 - 22 SG pressure is 900 PSIA
 - CETs are reading 475 °F

Which one of the following actions must be taken per EOP-4?

- A. Dump steam from 21 SG to raise RCS cooldown rate to ~100 °F per hour to minimize the time of the SG blowdown.
- B. Dump steam from 22 SG to raise RCS Subcooled Margin to ~140 °F to minimize the time of SG blowdown.
- C. Dump steam from 21 SG until it is within 25 °F of CET average temperature.
- D. Dump steam from 22 SG until it is within 25 °F of CET average temperature.

63. Given the following:

- * Unit 1 is in Mode 2 at the POAH
- * Regulating Group 4 Inhibit Bypass Pushbutton Switch and the CEA Motion Inhibit Bypass Momentary Pushbutton are depressed
- * A "Secondary CEA Position Deviation" alarm is annunciated at 1C05

Which one of the following describes the effect on the CED System?

- A. CMI enabled to Regulating Group 4 and bypassed to all remaining Groups.
- B. CMI is bypassed to Regulating Group 4 and enabled to all remaining Groups.
- C. CWP is bypassed to all Regulating Groups only.
- D. CWP is enabled to all Regulating Groups only.

64. Given the following:

- * Unit 2 is at 65% power
- * A loss of 23 4KV Bus occurs

Which one of the following is the stabilizing actions for the event?

- A. Verify 2 Condensate pumps and 1 CBP are running.
- B. Trip the Reactor and implement EOP-0.
- C. Verify 1 Condensate pump and 2 CBPs are running.
- D. Reduce power as required to maintain condensate flow less than 10,000 GPM.

65. Given the following:

- * Unit 2 is at 100% power
- * RO observes concurrent feedwater flow decrease with increasing SGFP suction flows
- * CRO observes suction pressure to both SGFPs has decreased and hotwell level is decreasing

Which one of the following is the required actions based on plant conditions?

- A. Perform a rapid power reduction per OP-3 to <70% power, determine source of leakage on feedwater header. Implement EOP-0 if SG water levels decrease to RPS Pre-trip annunciator alarms.
- B. Trip the reactor, implement reactivity control of EOP-0, secure/trip SGFPs, HTR Drn pumps, CBP and all condensate pumps. Shut SG FW ISOL valves, implement remainder of EOP-0.
- C. Perform an expeditious power decrease per OP-3 to <70% power, isolate source of leakage on condensate or feedwater header. Implement EOP 0 based on SM or CRS direction.
- D. Trip the reactor, implement EOP 0, perform alternate actions for Core and RCS Heat Removal Safety Function. Transition to AOP-3G to determine and isolate the condensate or feedwater leak.

66. Given the following:

- * Unit 2 is at 10% power
- * All controls are in automatic
- * CVCS is in a normal lineup with 1 charging pump running
- * A transient results in pressurizer level lowering 20 inches below setpoint.

Which one of the following is the expected response without operator action?

- A. Letdown flow is at minimum (~30 GPM) and Charging flow is ~ 44 GPM.
- B. Letdown flow is nominal (~40 GPM) and Charging flow is ~88 GPM.
- C. Letdown flow is at minimum (~30 GPM) and Charging flow is ~132 GPM.
- D. Letdown flow is nominal (~80 GPM) and Charging flow is ~132 GPM.

67. Given the following:

- * MWMT discharge is in progress going to the Unit 2 discharge conduit
- * ABO reports that "21 REFUEL WTR STORAGE AREA SUMP LEVEL HI" alarm came in at 1C63 panel
- * OSO reports that Unit 2 RWT is leaking in the RWT Room

Which one of the following is the correct response for the stated conditions?

- A. Direct the ABO to investigate the Liquid Waste Discharge lineup.
- B. Direct the ABO to investigate a possible overflow of the Aux Building 5 Foot Elevation drains.
- C. Implement AOP-6B (Accidental Release of Radioactive Liquid Waste) due to MWMT discharge.
- D. Implement AOP-6B (Accidental Release of Radioactive Liquid Waste).

68. Which one of the following is the effect of a loss of detector signal from an area radiation monitor?

- A. The channel reading at 1C22 will fail high resulting in an inoperable channel.
- B. The CHECK SOURCE light will energize requiring a check source test.
- C. The power on indication will deenergize requiring a test per OI-35.
- D. A LOW ALARM will be indicated on 1C22 resulting in an inoperable channel.

69. Following the loss of 12 120V Vital AC bus, the performance of steps in AOP-7J requires the ESFAS Sensor cabinets to be reenergized prior to the Logic cabinets.

Which one of the following is the basis for the order of the steps?

- A. Prevent inadvertent actuation since the Logic modules are deenergized to actuate and the Sensor modules are energized to actuate.
- B. Prevent actuation since the Logic modules are energized to actuate and the Sensor modules are deenergized to actuate.
- C. Properly align the Under Voltage Logic Relays.
- D. Properly align the Under Voltage Sensor Relays.

70. Using the provided reference and given the following:

- * Unit 1 is at 100% power
- * Regulating Group 5 CEAs are at 129 inches for testing
- * CEA 1 Pulse counting position indicator indicates 129 inches while CEAPDS indicates 124 inches

Which one of the following describes the actions (if any) that comply with the TRM requirements?

- A. TRM requirements are met, no actions are required.
- B. Restore the CEAPDs indication within 6 hours.
- C. Borate power to <70% and withdraw CEA 1 to FULL OUT position within 6 hours.
- D. Borate power to <70% and withdraw Group 5 to FULL OUT position within 6 hours.

71. Given the following:

- * Unit is at 100% power
- * "CSAS ACTUATED" alarm is annunciated at 1(2)C08
- * Containment pressure indicates .5 PSIG

Which one of the following describes the expected system response?

- A. CS pump(s) running and SI-4150 and/or SI-4151 is/are OPEN.
- B. PS-6531-SV, Quench Tank sample valve is SHUT.
- C. SI-4150 and/or 4151 is/are OPEN.
- D. NO system response due to a spurious actuation has occurred.

72. A CAR unit has been shutdown and the inlet CV has failed to shut. If the CAR is in the "Holding Mode", describe the effect, if any:

- A. Air will not leak into the condenser.
- B. Air will leak into the condenser via the seal water recirc pump.
- C. Air will leak into the condenser via the hogging CV.
- D. Air will leak into the condenser via the three way valve.

73. Given the following:

- * Unit 1 is in Mode 3
- * SIAS Pressurizer Pressure Blocked on both logic channels
- * RCS pressure being reduced to 1500 PSIA
- * PZR Spray valves fail shut and RCS pressure starts to rise

Select the expected system response as pressure rises:

- A. SIAS Pressurizer Pressure Block will be manually removed when the RO goes to "NORMAL" at 1800 PSIA with the keyswitch for SIAS Block A at 1C10.
- B. SIAS Pressurizer Pressure Block will be automatically removed when 2 SIAS Pressurizer Pressure Block sensors clear
- C. SIAS Pressurizer Pressure Block will be manually removed when the RO goes to "NORMAL" at 1800 PSIA with both keyswitches for SIAS Block A and B at 1C10.
- D. SIAS Pressurizer Pressure Block will be automatically removed when 1 SIAS Pressurizer Pressure sensor clears.

74. Given the following:

- Unit 1 is at 100% power
- The 1B DG is running unloaded for post maintenance testing, Electric Shop and Mechanical maintenance personnel are standing by in the 1B DG Room
- CRO reports a "1B DG" alarm is received at 1C18B
- OSO reports a "START FAILURE" alarm is received at the 1B DG Alarm panel
- Electricians suspect blown fuses, requesting to replace them immediately.

Using the provided electrical schematic, determine which fuse(s) have blown, resulting in the indicated response on the 1B DG:

- A. Fuses FU7 and FU8 due to the start failure alarm that was annunciated from the loss of control power.
- B. Fuses FU1 and FU2 due to the start failure alarm that annunciated from the loss of control power.
- C. Fuses FU3 and FU4 due to start failure alarm from the engine running with the air start solenoids failed close.
- D. Fuses FU5 and FU6 due to the start failure alarm from the loss of power to the low speed and auxiliary stop relays.

75. Given the following:

- * Unit 1 is in Mode 3
- * RCS pressure is 325 PSIA and temperature is 355 °F
- * PORV Block Valve RC 403 is OPEN
- * PORV Block Valve RC 405 is SHUT
- * HS 1406 (PORV 402 MPT Protection) is in "VARIABLE MPT ENABLE"
- * HS 1408 (PORV 404 MPT Protection) is in "NORMAL"
- * PORV 402 override is in "AUTO"
- * PORV 404 override is in "AUTO"
- * PT 103-1 Pressurizer Low Range pressure transmitter fails to 1500 PSIA

Which one of the following describes the response to the conditions?

- A. ERV-402 stays ENABLED and OPENS.
- B. ERV-404 is ENABLED and OPENS.
- C. ERV-402 stays ENABLED and remains SHUT.
- D. ERV-404 is ENABLED and remains SHUT.

76. The most serious failure for the Spent Fuel Pool Cooling System is the loss of SFP Water. What feature of the system is designed to prevent this?

- A. Piping interconnection to either RWT.
- B. Piping interconnection from Safety Injection systems.
- C. Two channels of remote level indication with alarm function.
- D. SFP pipe connections with siphon breakers, above the water level in SFP.

77. A smoke detector fails and goes into alarm for the Unit 1 27 Foot Switch Gear Room.

Which one of the following describes the effect on the system?

- A. Pre-Alarm buzzer sounds and after a time delay, Halon system discharges.
- B. Pre-Alarm buzzer sounds but does not result in Halon system discharge.
- C. Discharge warning horn sounds and after a time delay, Halon system discharges.
- D. Discharge warning horn sounds but does not result in Halon system discharge.

78. Given the following:

- Unit 2 is 100% power
- LT-110X Pressurizer level channel selected
- HS-100-3, Pzr Htr Lo Lvl cut-off is selected in "X / Y" position

Describe the effect on the RCS if LT-110X fails due to a leak in the reference leg:

- A. Indicated Pressurizer level will increase due to Letdown going to minimum and backup charging pumps stop.
- B. Indicated Pressurizer level will decrease due to Letdown going to maximum, exceeding Charging pump capacity.
- C. Actual Pressurizer level will decrease, Letdown goes to maximum, PZR Backup Heaters energize.
- D. Actual Pressurizer level will increase, Letdown goes to minimum, backup Charging pumps stop.

79. Given the following:

- * Unit 2 is a 100% power
- * All control systems in automatic
- * Reactor trips on MT EHC system failure

Which one of the following describes the expected plant response?

- A. Post-trip DFWCS relay is energized, MFVs ramp shut over 20 seconds, BFVs open to 56%.
- B. DFWCS shifts to low power mode on RRS NI power input, BFVs open to 33%.
- C. Post-trip DFWCS relay is deenergized, MFVs ramp shut over 30 seconds, BFVs open to 65%.
- D. DFWCS shifts to low power mode after 20 seconds by relays from MT trip circuit, BFVs open to 65%.

80. Unit 1 is at full power when a reduction occurs in the Instrument Air Header pressure. The CRO observes that IA header pressure has decreased to 85 PSIG and PA Header is at 85 PSIG also.

Which one of the following describes the expected automatic action that will occur at this pressure?

- A. PA-2061-CV, PA to IA Cross connect Valve OPENS.
- B. PA-2059-CV , PA header Isolation Valve SHUTS.
- C. Standby Instrument Air Compressor STARTS.
- D. IA-2085-CV, Containmant IA Isolation Valve SHUTS.

81. Given the following:

- Unit 1 is in Mode 6
- Fuel Handling is in progress
- Containment Purge is in operation

Which of the following monitors should **NOT** be functionally tested per OI-35 (Radiation Monitoring System)?

- A. Fuel Handling Area Monitor (RI-5420).
- B. Containment Area Radiation Monitor (RI-5316A-D).
- C. Main Vent Gas Monitor (RI-5415).
- D. Containment ICI Area Monitor (RI-7008).

82. Given the following:

- Unit 1 is in Mode 3, NOT and NOP (previously was at 100% power for 245 days)
- Chemistry reports that the trend on weekly samples indicate an increase in the RCS activity for non-soluble matter
- NFM reports that a review of CECOR data indicates that fuel rod fouling is increasing

Which condition will cause 1C07 alarm F-21 "RAD MON LVL HI" to alarm AND a dose rate change in the Letdown line?

- A. LOCA inside the Containment resulting in stopping RCPs after CIS actuation.
- B. LOCA outside the Containment resulting in activity in the 27 Foot West Penetration Room.
- C. Establishing forced circulation by starting RCPs after a Loss of Offsite Power.
- D. Starting additional Charging pumps in response to an RCS leak.

83. Given the following:

- * Both Units are at 100% power
- * MS line Rad Monitor status:

	Unit 1 (11/12)	Unit 2 (21/22)
NORM White light	on/on	on/on
FAIL Green light	off/off	on/on
ALERT Amber light	off/on	off/off
HIGH Red light	off/on	off/off

Which one of the following describes the operational status of the RMS?

- A. Unit 1 both operable and Unit 2 both inoperable.
- B. Unit 1 one RMS inoperable and Unit 2 one RMS inoperable.
- C. Unit 1 both RMS inoperable and Unit 2 both RMS inoperable.
- D. Unit 1 both RMS inoperable and Unit 2 both RMS operable.

84. Given the following:

- * Unit 2 is in Mode 1 and the Main Turbine has just been paralleled to the Grid
- * Alarm "LOSS OF LOAD CH TRIP BYPASS" is clear at 2C05
- * Condenser Vacuum is decreasing and the Main Turbine trips

Which one of the following describes the expected plant response?

- A. 4 limit switches on the MT Stop Valves generate a 2/4 trip signal to RPS resulting in a Loss of Load reactor trip.
- B. Master trip solenoids energize to generate a 2/4 trip signal to the RPS resulting in a Loss of Load reactor trip.
- C. 4 Auto stop oil pressure switches actuate to generate a 2/4 trip signal to the RPS resulting in a Loss of Load reactor trip.
- D. Master trip bus deenergizes to drop out 4 relays in the RPS trip logic resulting in a Loss of Load reactor trip.

85. Given the following:

- * Unit 1 is in Mode 5
- * All Circulating Water pumps are running
- * SG Blowdown IX is bypassed with RI-4095 in service
- * SG Blowdown is lined up to Unit 1 Circulating Water to lower SG water levels while in wet layup
- * RE 4014 RMS (SG Blowdown Tank) loses power

Which of the following describes the system response?

- A. Discharge to the Circulating Water is shifted to the Main Condenser via BD-4096-CV.
- B. Discharge to the Circulating Water remains unchanged.
- C. Discharge is stopped as 1-BD-4010, 4011, 4012 and 4013 SHUT.
- D. Discharge is stopped as 1-BD-4096, 4015 and 4097- CVs SHUT.

86. Given the following:

- * Unit 1 is in Mode 5
- * Applicable 13.8 KV Voltage Regulators are in MANUAL
- * CRS directs the CRO to transfer from 4KV Bus 15 Feeder to 4KV Bus 16 Feeder

Which one of the following describes the proper sequence to perform this action?

- A. Insert sync stick for BUS tie breaker , observe voltages match and sync scope rotating slowly in the fast direction in the Control Room, CLOSE tie breaker and OPEN Bus 16 feeder.
- B. Insert sync stick for Bus 16 feeder breaker, observe voltages match locally at the Voltage Regulator cabinets and sync scope not rotating, CLOSE Bus 16 feeder breaker and OPEN Bus 15 feeder.
- C. Insert sync stick for Bus 15 feeder breaker, observe voltages match locally at the Voltage Regulator cabinets and sync scope rotating slowly in the fast direction, CLOSE tie breaker and OPEN Bus 16 feeder.
- D. Insert sync stick for BUS tie breaker, observe voltages match and sync scope not rotating, CLOSE 15/16 tie breaker and OPEN Bus 15 feeder.

87. Which one of the following describes the effect on decay heat removal after a Unit 1 Turbine Trip from a loss of 11 125 VDC Bus?

- A. ADVs and TBVs unavailable in all modes (quick open and modulating).
- B. TBVs unavailable in all modes (quick open and modulating), ADVs operate in manual from 1C03.
- C. ADVs unavailable in all modes (quick open and modulating), TBVs operate in manual or auto from 1C03.
- D. ADVs and TBVs quick open mode is removed, ADVs and TBVs will operate in manual or auto from 1C03.

88. Given the following:

- * Unit 1 is at 20% power
- * DFWCS has automatically shifted to HIGH POWER mode
- * Loss of high voltage power Control Channel X NI

Which one of the following describes the effect on the plant?

- A. DFWCS shifts to low power mode on 11 SG.
- B. DFWCS stays in the high power mode on 11 SG only.
- C. DFWCS stays in the high power mode on both SGs.
- D. DFWCS shifts to single input in the high power mode on both SGs.

89. Given the following:

- * A LOCA has occurred on Unit 2
- * EOP 5 has been implemented
- * CRO has started the H₂ Recombiners per OI-41A (Hydrogen Recombiners)
- * The CRO later observes that 21 H₂ Recombiner has malfunctioned and 22 H₂ Recombiner is operating satisfactorily

Which one of the following describes the required action, if any, to control H₂ volume to <4% during a LOCA?

- A. Containment H₂ control will require the repair of 21 H₂ Recombiner within 24 hours.
- B. Containment H₂ control will require the use of the Hydrogen Purge System within 24 hours.
- C. Containment H₂ control will require the use of alternate procedures from the TSC.
- D. No further actions are required to maintain H₂ <4% by volume by design.

90. Given the following:

- * Unit 1 is in Mode 6 with fuel off-load in progress
- * RFM is being operated in AUTO mode
- * Off indexing is being used during a fuel assembly insertion in the core
- * OFF INDEX ZONE BREACHED is indicated on the CRT

Which one of the following is the action required to complete the fuel move?

- A. Raise the fuel to the hoist up limit and select SEMI-AUTOMATIC mode to reposition the RFM to the Off index zone.
- B. Lower the hoist in slow speed until the Upper Grapple Operate Zone and position the RFM to On Index.
- C. Use TRAVEL OVERRIDE to return within the Off index zone and continue with hoist lowering.
- D. Reset the alarm by depowering the RFM console and complete the fuel move from the RFM in MANUAL ELECTRIC control.

91. Which one of the following conditions is indicated when the LOAD CHANNEL light on the Unit 2 turbine control panel is lit?

- A. Failure in the Impulse Pressure feedback loop has occurred and the EHC system is in the IMP OUT mode.
- B. Failure in the Impulse Pressure feedback loop has occurred and the EHC system is in the TURBINE MANUAL mode.
- C. Failure of the Turbine Actual Reference counter has occurred and the EHC system is in the TURBINE MANUAL mode.
- D. Failure of the Turbine Actual Reference counter has occurred and the EHC system is in the IMP OUT mode.

92. Which one of the following is the design basis for the Quench Tank volume?

- A. Continuous discharge of both PORVs with no operator action.
- B. Continuous CEA withdrawal event from low power.
- C. Continuous RCS degassing using both Reactor Vent Valves.
- D. Continuous discharge from 1 Primary Safety Valve during loss of load event.

93. Given the following:

- * Unit 1 Reactor is manually tripped from 100% power
- * 11 RCS hot leg loop RTD to RRS fails high to 615°F
- * No operator action is taken

Which one of the following describes the initial response of the ADVs and TBVs and final plant conditions?

- A. ADVs and TBVs both OPEN due to Quick Open signal for a longer period of time than normal, then the TBVs will SHUT and ADVs control RCS at a lower temperature band around 505 °F .
- B. The failed input to RRS is deleted by the Tave calculator, ADV and TBV operation is unchanged (including Quick Open) with RCS temperature control by the ADVs at the expected post trip band of ~532 °F.
- C. The failed input to the RRS inhibits the Quick Open features of the ADVs and TBVs resulting in both a lift of MSSVs and ADVs and TBVs staying open longer with the RCS temperature control by the ADVs at a lower temperature band ~ 505 °F.
- D. ADVs and TBVs both OPEN due to Quick Open signal for a longer period of time than normal, then the ADVs will SHUT and TBVs control RCS at a lower temperature band around 505 °F .

94. Given the following:

- * Unit 1 is at 100% power
- * 14 4KV bus trips on a ground fault
- * AOP 7I (Loss of 4KV, 480 Volt or 208/120 Volt Instrument Bus Power) is implemented
- * 1Y10 is tied to 1Y09

Which one of the following describes the specific stabilizing action to be taken to prevent a possible reactor trip?

- A. Repower 14 4KV Bus by use of Alternate Feeder Breaker 152-1414.
- B. Shift 13 CC pump to 11B 480V Bus
- C. Repower 14 4KV Bus by use of 0C DG.
- D. Shift 13 SW and 13 SRW pumps to 11 4KV Bus and restore 12 SW and 12 SRW Header flows