September 29, 1997

NOTE TO: NRC Document Control Desk
Mail Stop 0-5-D-24

FROM: Virgil Curley, Licensing Assistant
Operating Licensing Branch, R I

SUBJECT: OPERATOR LICENSING EXAMINATION ADMINISTERED ON June 9-12, 1997, AT Maine Yankee
DOCKET #50-309

On June 9-12, 1997 Operator Licensing Examinations were administered at the referenced facility. Attached, you will find the following information for processing through NUDOCS and distribution to the NRC staff, including the NRC PDR:

Item #1 - a) Facility submitted outline and initial exam submittal, designated for distribution under RIDS Code A070.

b) As given operating examination, designated for distribution under RIDS Code A070.

Item #2 - Examination Report with the as given written examination attached, designated for distribution under RIDS Code IE42.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

July 8, 1997

Mr. Michael B. Sellman
President
Maine Yankee Atomic Power Company
329 Bath Road
Brunswick, Maine 04011

SUBJECT: MAINE YANKEE INITIAL EXAM REPORT NO. 50-309/97-04(OL)

Dear Mr. Sellman:

This report transmits the findings of the reactor operator licensing exams conducted by NRC examiners during the week of June 9, 1997 at Maine Yankee. All applicants passed all portions of the exam. At the conclusion of the exam, Mr. J. H. Williams discussed the preliminary findings with Mr. G. Leitch of your staff.

Based on the exam we believe that Maine Yankee management should review the policy for operators' compliance with emergency operating procedures (EOPs). As it is impossible to formally review and revise EOPs during their execution, there are times when operators are expected to use their knowledge to apply EOPs in an intelligent manner. Nonetheless, in this exam and in a previous requalification exam (report 93-09 - OL/RQ), operators chose to apply the same EOP decision step in widely different manners. The initiation of primary feed and bleed in procedure FR-H1 is to occur at steam generator levels of 100 inches. In 1993 the operator chose to wait to initiate feed and bleed until levels of 80 inches and in this exam the candidate chose to initiate in advance at levels of 125 inches.

The purpose of the above comment is not to insist on initiation exactly at 100 inches, but to request that Maine Yankee evaluate their policy that addresses the latitude that operators have in implementing the EOPs and the process to be used by the control room team when modifying the EOP implementation. In both instances, the NRC disagreed with its acceptability and noted that the Maine Yankee policy had some uncertainty, including the process for reviewing the modification and communicating its implementation. Intelligent compliance with EOPs is desirable if it enables some operator modification of EOP implemention to improve safe mitigation of events based on the operator's understanding of the specific event conditions, but Maine Yankee management should address their expectations on when and how such EOP modifications are to be done in light of the recently observed instance.

For these exams Maine Yankee personnel developed all segments of the exams, while the NRC provided oversight and final approval prior to the administration of the exams. The examiners judged that Maine Yankee had done an excellent job of developing the exam.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

9707150129 2pp.

1/1 IE42

Mr. Michael B. Sellman

No reply to this letter is required, but should you have any questions regarding this examination, please contact me at 610-337-5211, or by E-mail at GWM@NRC.GOV.

Sincerely,

Glenn W. Meyer, Chief
Operator Licensing and
Human Performance Branch
Division of Reactor Safety

Docket No. 50-309

Enclosure: Initial Examination Report No. 50-309/97-04 (OL) w/Attachments 1-3

cc w/encl; w/o Attachments 1-3:
G. Leitch, Vice President, Operations
M. Meisner, Vice President, Licensing and Regulatory Compliance
R. Fraser, Vice President, Engineering
J. M. Block, Attorney at Law
P. L. Anderson, Project Manager (Yankee Atomic Electric Company)
R. Blackmore, Plant Manager
L. Diehl, Manager of Public and Governmental Affairs
J. A. Ritsher, Attorney (Ropes and Gray)
P. Dostie, State Nuclear Safety Inspector
P. Brann, Assistant Attorney General
U. Vanags, State Nuclear Safety Advisor
C. Brinkman, Combustion Engineering, Inc.
W. D. Meinert, Nuclear Engineer
First Selectmen of Wiscasset
Maine State Planning Officer - Nuclear Safety Advisor
State of Maine, SLO Designee
State Planning Officer - Executive Department
Friends of the Coast
L. Elisa, Regional Director - FEMA Region I
L. Canton, Regional Director - FEMA Region II
R. Calvan, Regional Director - FEMA Region III

cc w/encl and Attachments 1-3:
R. Hayward, Manager - Training
M. Evringham, Operations Training Section Head

U. S. NUCLEAR REGULATORY COMMISSION
REGION 1

Docket No.	50-309
Report No.	97-04
License No.	DPR-36
Licensee	Maine Yankee Atomic Power Company
Facility	Maine Yankee
Location	Wiscassett, Maine
Dates	June 9-12, 1997
Chief Examiner	J.H. Williams, Senior Operations Engineer/Examiner
Examiners	J.M. D'Antonio, Operations Engineer/Examiner I.G. Kingsley, NRC Contract Examiner, Sonalyst J. Ellis, NRC Observer
Approved By	Glenn W. Meyer, Chief, Operator Licensing and Human Performance Branch Division of Reactor Safety

EXECUTIVE SUMMARY

Maine Yankee Atomic Power Plant
Inspection Report No. 50-309/97-04 (OL)

Operations

Four reactor operator (RO) candidates and one SRO upgrade candidate were administered initial licensing exams. All candidates passed all portions of the license exam.

A weakness was noted in the area of attention to detail when following procedures during the operating tests, including skipped steps and steps performed out of sequence. This weakness was presented to facility representatives at the conclusion of the exam. The facility representatives indicated that actions would be taken to strengthen procedure adherence. Also, the examiners noted an inappropriate feed and bleed initiation in advance of the action level and questioned how the EOP modification policy addressed this.

Report Details

I. Operations

05 Operator Training and Qualifications

05.1 Senior Reactor Operator and Reactor Operator Initial Exams

a. Scope

The exams were prepared by Maine Yankee personnel in accordance with the guidelines in Revision 7, Supplement 1, of NUREG-1021, "Examiner Standards," and Revision 5 of NUREG-BR-0122, "Examiners' Handbook for Developing Operator Licensing Written Examinations." The examiners administered initial operating licensing exams to four reactor operator (RO) candidates and one SRO upgrade candidate. The written exams were administered by the facility's training organization.

b. Observations and Findings

The results of the exams are summarized below:

	RO Pass/Fail	SROU Pass/Fail	Total Pass/Fail
Written	4/0	1/0	5/0
Operating	4/0	1/0	5/0
Overall	4/0	1/0	5/0

The written exams, job performance measures (JPMs) and simulator scenarios for were developed by Maine Yankee representatives in accordance with generic letter guidelines, GL 95-06, "Changes in the Operator Licensing Program." The exam development team was comprised of training and operation representatives. All individuals signed onto a security agreement once the development of the exam commenced. The NRC subsequently reviewed and validated all portions of the proposed exams. Various changes and/or additions to the proposed exams were requested by the NRC following their review. Maine Yankee personnel incorporated the NRC's comments and finalized the exams.

The written exams were administered on June 9, 1997. Both written exams consisted of 100 multiple choice questions. After the exams were administered, one question was found to have two correct answers. Both correct answers were accepted as correct.

The operating tests were conducted June 10-12, 1997. The operating tests consisted of two simulator scenarios and ten JPMs for the RO candidates and two simulator scenarios and five JPMs for the SRO upgrade candidate. All JPMs were followed up with two system-related questions. All candidates were also examined to evaluate the administrative requirement portion of the exam.

The written exam performance was evaluated to determine if any generic weaknesses could be identified. While several questions were missed by more than one candidate, no generic weaknesses were identified.

Simulator performance by the candidates was good. However, in one scenario while performing emergency procedure FR-H.1, "Loss of Secondary Heat Sink", the crew initiated feed and bleed before it was needed and not in accordance with procedure. Specifically, the SRO candidate initiated feed and bleed at 125 inches steam generator level, prior to the 100 inches action point. After the exam, the examiner discussed the issue with the facility. The facility indicated that additional training would be performed on the need to follow procedures when initiating feed and bleed.

During the operating tests the examiners noted several examples where candidates did not follow procedures. In addition to the feed and bleed incident discussed above, the following examples were noted.

- Procedure steps were skipped in two JPMs. In one case this resulted in an unsatisfactory grade for the JPM.

- Procedure steps were performed out of sequence in two JPMs. In one case this resulted in an unsatisfactory grade for the JPM.

- Procedure steps were not completed in the time specified in the procedure.

Other observations made by the examiners during the operating tests included:

- Procedure 3.1-20.4, Step 6.24.6, required closing both PORV block valves at the same time. Both the candidate and the examiner questioned the desirability of closing both valves at the same time during the surveillance test.

- AOP2-48, Attachment A referred to doors with different door numbers on each side of the door, but not so numbered or identified in the procedure. This caused some confusion for the candidates during the test.

These observations were discussed with facility representatives and they agreed to review these findings.

c. Conclusions

The candidates performed well on both the written and operating exams, and thus were issued licenses. The candidates appeared to be well prepared for the exams. The Maine Yankee training department did an excellent job in adhering to the examiner standards and in developing the exam materials needed to administer the exams.

E8 Review of UFSAR commitments

A recent discovery of a licensee operating their facility in a manner contrary to the updated final safety analysis report (UFSAR) description highlighted the need for a special focused review that compares plant practices, procedures and /or parameters to the UFSAR descriptions. While performing the preexamination activities discussed in this report, the examiner reviewed applicable portions of the UFSAR that related to the selected exam questions or topic areas. No discrepancies were identified as a result of this review.

V. Management Meetings

X1 Exit Meeting Summary

On June 12, 1997, the examiners discussed their observations from the exams with operations and training management representatives, led by Graham Leitch. The examiners discussed generic candidate performance, detailed in paragraph 5.1.b above, concerning procedures. The facility representatives acknowledged the findings presented. The examiners also expressed their appreciation for the cooperation and assistance that was provided during both the preparation and exam week by licensed operator training personnel.

The examiners noted no simulator fidelity problems.

Further, in a July 8, 1997, Glenn Meyer discussed the cover letter comment regarding EOP modification policy with Jon Kirsch, acting supervisor of operator training.

Attachments:
1. Maine Yankee SRO written exam w/answer key
2. Maine Yankee RO written exam w/answer key
3. NRC Resolution of written examination comments

Attachment 1

MAINE YANKEE SRO WRITTEN EXAM W/ANSWER KEY

(10+V ORIGINAL W/ANSWER KEY

U.S. NUCLEAR REGULATORY COMMISSION
MAINE YANKEE (CE)
SENIOR REACTOR OPERATOR WRITTEN EXAMINATION

APPLICANT INFORMATION

NAME:_____ DATE:_____

INSTRUCTIONS

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Each question is worth one (1) point. The passing grade is 80%. Examination papers will be picked up four (4) hours after the examination starts.

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

_____
Applicant's Signature

RESULTS

Examination Value . . . . . 100 points

Applicant's Score . . . . . ___ points

Applicant's Grade . . . . . ___ points

_____
Graded by / Date

_____
Verified by / Date

Policies and Guidelines for taking NRC Written Examinations

1. Cheating on the examination will result in a denial of your application and could result in more severe penalties.

2. After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.

3. To pass the examination, you must achieve a grade of 80 percent or greater.

4. Each question is worth one (1) point.

5. There is a time limit of 4 hours for completing the examination.

6. Use only black ink or dark pencil to ensure legible copies.

7. Print your name in the blank provided on the examination cover sheet and the answer sheet.

8. Mark your answers on the answer sheet provided and do not leave any question blank.

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

10. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

11. When you complete the examination, assemble a package including the examination questions, examination aids, and answer sheets and give it to the examiner or proctor. Remember to sign the statement on the examination cover sheet.

12. After you have turned in your examination, leave the examination area as defined by the examiner.

1. The plant has just completed a chemistry hold at 20% power and is escalating power at 10%/hour to 55%. As plant temperature is changed, all four (4) power range channels receive an NI/delta T power alarm. What action is required by the operators?

   A. The power increase can continue until 55% power at which time an NI calibration and adjustment must be performed.

   B. The power increase should be terminated and the operator can manually adjust the NI potentiometer to clear the alarm.

   C. The power increase can continue as long as the NI/delta T power deviation does not go offscale on the RPSCIP panel.

   D. The power increase should be terminated and an NI calibration and adjustment should be performed to restore alarm operability.

2. A waste gas release is in progress per OP 1-21-3, "Waste Gas Release." The primary vent stack APD (RM-3902X) has just gone into alarm on "LOW FLOW." The primary side AO reports that P-169 (PVS air particulate pump) is not running and that P-140 (PVS air particulate pump) is tagged out. What action is required and why?

   A. Continue the release, but lower the trip setpoint on the waste gas release valve (WD-P-211) to within 25 CPM above background because of low flow.

   B. Immediately terminate the release because a low primary vent stack flow (<20,000 CFM) will trip shut the waste gas release valve (WD-P-211).

   C. Continue the release, but lower the waste gas release rate (CFM) to one half the value specified in the release permit because of low dilution flow.

   D. Immediately terminate the release because of lack of flow through the halogen and particulate sampling device on the primary vent stack.

3. With power at 1% Engineering informs you that some EFW suction pipe hangers in the EFW pump room do not meet seismic requirements (some bolts are not the proper specification but can be repaired in about 4 hours). At this point management expects you to:

   A. Declare the EFW system inoperable and immediately commence a reactor shutdown per Technical Specification 3.0.A.

   B. Keep power below 2% and enter the remedial actions allowed by Technical Specification 3.8.

   C. Declare the EFW system operable as long as the operability of the EFW flow control and isolation valves is assured.

   D. Maintain the hot standby condition between 10-2% and 1% for the next sixteen (16) hours and consult with Operations management.

4. A reactor startup is about to commence. Which condition ensures 115 KV line operability for Section 69?

   A. P-2A is operating and P-2B is in pull-to-lock.

   B. P-2A is operating and 115 KV line voltage is 113 KV.

   C. P-2A and P-2B are both in automatic.

   D. Section 69 does not meet 115 KV line operability requirements.

5. A steam generator tube ruptu[illegible]s in progress. The steam generator subcooled margin monitor reads 38 °F. What mu[illegible] be done to equalize steam generator and RCS pressures?

   A. Open the turbine bypass valves to reduce steam generator pressure.

   B. Open the pressurizer spray valves to reduce RCS pressure.

   C. Isolate the steam generators to increase steam generator pressure.

   D. Energize the pressurizer heaters to increase RCS pressure.

6. During performance of white tagging for LD-A-9 (letdown flow control valve) repairs, independent verification is required per procedure 0-14-1, "White Tagging Procedure." It is estimated that a significant radiation exposure (>10 mrem) will be received during second verification. What guidance would you provide the operators for independent verification in a radiation area?

   A. Independent verification is not required as long as the second checker reviews the valves tagged with the first.

   B. Independent verification is not required whenever a significant radiation exposure may be received.

   C. Independent verification is required and is accomplished by viewing tags from a remote location.

   D. Independent verification is required and is accomplished by observing system process parameters.

7. Which one of the following is an adverse consequence of containment control air pressure being less than 70 psig when in E-0, "Reactor Trip and Safety Injection"?

A. The pressurizer spray valves will fail open and result in loss of pressurizer pressure control.

B. The containment air recirculation fans will not maintain containment pressure <70 psia on LOCA.

C. The primary component cooling supply to the reactor coolant pumps will be lost.

D. The seal water supply and return flow to the reactor coolant pumps will be lost.

8. During an accident, the following EOP's are entered (in order of entry):

- Entered E-O, "RX Trip/Safety Injection" & EXITED at Step 10 due to loss of heat sink;
- Entered FR-H.1, "Loss of Heat Sink", and referred to E-0 at Step 16 to complete immediate actions of E-O;
- Continues in FR-H.1 and EXITED at Step 25 RNO for PORV's failing to close with heat sink re-established;
- Entered E-1, "Loss of Primary or Secondary Coolant", and EXITED at Step 11 due to HPSI and spray pumps unable to supply adequate flow to RCS;
- Entered ECA-1.1, "Loss of Cold Leg Recirculation", and EXITED at Step 32 to "Return to Procedure and Step in Affect."

At this point the operator will:

A. Return to E-O to complete any missed actions out to Step 25 when CSF Status trees are monitored.

B. Return to FR-H.1 to complete any missed actions associated with restoration of the heat sink.

C. Return to E-1 to complete actions required for loss of primary coolant.

D. Return to ECA-1.1 Step 1 to ensure continuous flow of coolant is available to the core.

9. Which of the following is the guidance for intentional operation under a remedial action statement for elective maintenance?

   A. When failure to repair a component results in enforcement action by the NRC.

   B. When maintenance procedures for component repair can be completed in less than eight (8) hours.

   C. When the cause of the inoperability of the component is known and documented in approved procedures.

   D. When performing component elective maintenance on-line clearly provides a net safety benefit.

10. A note in ES-0.2, "Natural Circulation Cooldown" states that "LTOP criteria cannot be met during natural circulation conditions without the HPSI flow restrictor in service." With a natural circulation cooldown occurring that is greater than 25 °F/hr., why is the dedicated operator stationed?

   A. Natural circulation cooldown could create an adverse thermal stress on the reactor vessel wall.

   B. Natural circulation cooldown is difficult to control when cooling down greater than 25 °F/hr.

   C. Natural circulation cooldown is the least desirable method, therefore, additional plant monitoring is required.

   D. Natural circulation cooldown will create voids that are not observable without PITS.

11. While monitoring Critical Safety Functions during a steam generator overfill/steam line break event, the operators have noted a greater than 100 °F/hr. cooldown rate. Pressurizer pressure and wide range Tcold are to the left of Limit A Curve, necessitating entry into a Functional Restoration Procedure. Which procedure would be entered and why?

A. Enter FR-P.1 due to concerns for thermal shock caused by rapid cooldown and to prevent flaw growth in the reactor vessel during repressurization.

B. Enter FR-P.1 due to concerns for thermal shock caused by rapid cooldown and to arrest compressive stresses on the inner wall during repressurization.

C. Enter FR-I.1 due to concerns for brittle failure caused by rapid cooldown and to prevent flaw growth in the reactor vessel during repressurization.

D. Enter FR-I.1 due to concerns for crystalline structure shift from face center to body center cubic which could lead to ductile failure.

12. The reactor is operating at 100% power when a main feed regulating valve (FW-F-207) fails open. What is the most likely sequence of events if P-2C is in operation and no operator action is taken?

A. Feed water header pressure decreases, standby MFW pump auto starts, P-2C speed increases, feed water header pressure increases, P-2C suction pressure increases.

B. Feed water header pressure decreases, P-2C speed decreases, standby MFW pump auto starts, feed water header pressure increases, P-2C suction pressure increases.

C. Feed water header pressure decreases, P-2C speed decreases, P-2C suction pressure decreases, standby condensate pump auto starts, P-2C speed increases.

D. Feed water header pressure decreases, P-2C speed increases, standby MFW pump auto starts, P-2C suction pressure decreases, standby condensate pump auto starts.

13. Following a refueling outage, the plant is returning to power and is at a 5% hold for S/G chemistry. Pressurizer pressure starts to decrease and then the primary RO reports that the "A" train SIAS pumps have automatically started. What action should be taken?

A. Enter AOP 2-10 to evaluate RCS leakage.

B. Enter E-0 in order to fire both trains of safety injection.

C. Enter AOP 2-25 to evaluate plant radiation levels.

D. Enter ES-1.1 to terminate safety injection.

14. Leakage from the stem packing on LD-T-37 (letdown temperature trip valve) has become unacceptable and management has chosen to repair the valve on-line (alternate letdown is in service). As the SOS, what concerns should be addressed prior to valve disassembly?

A. Establishing double valve boundaries, including freeze seals where applicable, to prevent inadvertant gas or liquid releases.

B. Securing ventilation flow in the PAB lower level to minimize unmonitored releases during valve disassembly.

C. Purging the hydrogenated vent header and VCT with nitrogen to minimize gas releases in the event of boundary failure.

D. Allowing valve draining without filtering because the process fluid in the piping is downstream of the purification demineralizers and filters.

15. Which of the following methods of communicating information is proper according to 1-300-6, "Operational Communications"?

A. When providing direction to change a parameter, use words such as "increase" or "decrease."

B. Use a first name to initiate communication and ensure the intended receiver is tuned in.

C. Acknowledging receipt of a repeat back is not required if the repeat back is correct.

D. When operating valves the phonetic alphabet should be used to describe the valve {i.e., charlie-delta four-niner (CD-49) is locked shut}.

16. Thermal mussel control operations are in progress on the south service water header. While performing this routine maintenance, the Operator must verify that the outboard heat exchanger (E-4A) delta P is not more than 2 psid higher than the inboard heat exchanger delta P (E-5A). What adverse consequence would result if this condition were allowed to occur?

A. The "A" train of ECCS would be inoperable due to inadequate flow through the outboard heat exchanger.

B. The "B" train of ECCS would be inoperable due to inadequate flow through the inboard heat exchanger.

C. The "A" train of ECCS would be operable, but necessitate starting an additional service water pump.

D. The "B" train of ECCS would be operable, but necessitate starting an additional service water pump.

17. Which of the following describes the transthermal condition as defined in Technical Specifications?

A. The reactor shutdown margin is 5% delta k/k and Tavg is between 200 °F and 500 °F.

B. The reactor is subcritical by 5% delta k/k and Tavg is between 210 °F and 500 °F.

C. The shutdown boron concentration is 5% delta k/k and Tavg is between 210 °F and 500 °F.

D. The reactor is shutdown by 5% delta k/k and Tavg is between 200 °F and 500 °F.

18. The plant has experienced a loss of two 120 VAC vital buses (vital buses 2 and 3). Emergency feed water control must be established in the Control Room. What is the proper sequence for re-establishing EFW flow to avoid water hammer damage?

A. Close EFW valve controllers, bypass feed train trip signal, place main feed, condensate and heater drain pumps in PTL, verify EFW pump operating, throttle open EFW flow control valves.

B. Bypass feed train trip signal, close EFW valve controllers, place main feed, condensate and heater drain pumps in PTL, verify EFW pump operating, throttle open EFW flow control valves.

C. Place main feed, condensate and heater drain pumps in PTL, bypass feed train trip signal, close EFW valve controllers, verify EFW pump operating, throttle open EFW flow control valves.

D. Place main feed, condensate and heater drain pumps in PTL, close EFW valve controllers, bypass feed train trip signal, verify EFW pump operating, throttle open EFW flow control valves.

19. With 120 VAC vital buses 1 and 4 cross-connected and powered from inverter 1 (the spare inverter is out of service) inverter 1 fails causing a loss of both buses. The reactor operator places the "B" train PORV (PR-S-15) in the "CLOSED" position. The valve indicates closed, but the acoustic accelerometer is still in alarm. What method is used to isolate the PORV?

A. Take the "B" train PORV block valve (PR-M-17) to "CLOSE" and return the PORV (PR-S-15) switch to "OFF."

B. Take the "B" train "HPSR/VPSR" switch to "VPSR" and raise the setpoint to 2400 psig to close the PORV.

C. Take the "B" train PORV block valve (PR-M-17) to "CLOSE" and then open the PR-M-17 breaker on MCC-8B.

D. Take the "B" train "HPSR/VPSR" switch to "HPSR" and raise the setpoint to 2400 psig to close the PORV.

20. While moving a spent fuel pool rack with the overhead crane, the rack drops and breaks open several spent fuel assemblies in the spent fuel pool. It is raining quite heavily at the time of the accident and several local roads, including plant access, are inaccessible. An "Alert" condition is declared. What is your responsibility as the PSS with respect to the Emergency Plan?

A. Acts as the Emergency Director and notifies the State Police within 15 minutes of the event classification.

B. Acts as the Emergency Director until the event is terminated or the classification is downgraded to an "Unusual Event."

C. Acts as the Operations Support Director and notifies the State Police within 15 minutes of the event classification.

D. Acts as the Emergency Director unless the event is upgraded to a "Site Area Emergency."

21. A liquid waste release lineup is in progress for the "A" test tank. While verifying the liquid waste monitor response (RM-3801), the operator informs you that the channel is not responding to the check source. What is your response as Shift Supervisor?

A. Declare RM-3801 inoperable; perform a double verification of the valve lineup; then release the test tank.

B. Attempt to identify the cause of the instrument response using I & C and maintenance assistance.

C. Determine that the waste effluent valve (WD-F-311) closes when RM-3801 alarms (by adjusting the setpoint down), then release the test tank.

D. Verify that the service water radiation monitor (RM-1601) is in service and lower the alarm setpoint to within 10% of background, then release the test tank.

22. A fire in the protected cable tray room (AOP 2-90-1) has spread into the control room ceiling and an evacuation of the control room is imminent. A station blackout must be created by the operator:

A. In order to prevent spurious PORV operation when de-energizing MCC-7A and 8A.

B. In order to prevent overloaded diesels because 3T5 and 4T6 will fail closed.

C. Due to the inability to control systems that may be operating.

D. Due to the inability to cool key plant components, such as RCP's.

23. The plant is in a cooldown using AOP 2-90-8, "Plant Cooldown From Alternate Shutdown Panel." Several times in this procedure the operator is cautioned that the RCS cold shutdown boron concentration is not reached unless pressurizer level is increased to 80% at some point during the cooldown. Why must the pressurizer be filled to this level?

A. Pressurizer level instrument (LI-106) on the ASP is hot calibrated 80% PZR level ensures that the PZR will have a bubble during the cooldown.

B. This guarantees adequate shutdown margin is achieved for the cold shutdown condition by ensuring sufficient RWST water is injected into the RCS.

C. This ensures the cold shutdown boron concentration listed in the TDB, even with rods fully withdrawn, is achieved.

D. This ensures adequate RCS volume in the event that normal power cannot be restored and a seal water return MOV does not close.

24. During a fire, the PSS mans the alternate shutdown panel (ASP) and proceeds to gain control of equipment necessary to minimize loss of RCS inventory. Which components must be controlled to stop RCS leakage?

A. Drain header isolation valve (DR-M-3) to "CLOSE"; EFCV's (MS-11, 22, and 33) to "CLOSE"; letdown temperature control valve (LD-T-5) to "CLOSE."

B. Drain header control valve (DR-A-6) to "CLOSE"; letdown temperature control valve (LD-A-68) to "CLOSE"; RCP seal water return valves (SL-M- 29, 40 and 51) to "CLOSE."

C. Drain header isolation valve (DR-M-3) to "CLOSE"; letdown temperature control valve (LD-A-68) to "CLOSE"; RCP seal water return valves (SL-M- 29, 40 and 51) to "CLOSE."

D. Drain header control valve (DR-A-6) to "CLOSE"; letdown temperature control valve (LD-T-5) to "CLOSE"; RCP seal water return valves (SL-M-29, 40, and 51) to "CLOSE."

25. The main turbine has numerous protective devices assuring plant and equipment safety including less direct methods of tripping the turbine. Which of the following methods will generate a remote turbine trip signal?

A. With T1H, KG-1, and KG1-375 open, the turbine will trip on a one minute time delay (anti-motoring).

B. With two-out-of-four (2/4) intercept valves closed and two-out-of-four (2/4) reheat valves closed, the turbine will trip.

C. With a low #2 S/G water level on channels A & B level in dications (2/2 taken twice), the turbine will trip.

D. Closure of all three (3) EFCV's, automatically or manually via operator action, will trip the turbine on low steam pressure.

26. While in FR-C.1, "Inadequate Core Cooling," the Operator notes LPSI flow oscillations when running a containment spray pump and a LPSI pump from the same safeguards sump. Assuming adequate water level in containment and the desire to run the LPSI pump during RAS to avoid inadequate core cooling, what action in the Control Room would mitigate LPSI pump cavitation in this condition?

A. Reset the RAS signal and throttle LSI-M-11, 21, and 31 (LPSI loop stops).

B. Reset the SIAS signal and throttle LSI-F-59 (RHR flow control).

C. Reset the RAS signal and throttle LSI-F-59 (RHR flow control).

D. Reset the SIAS signal and throttle LSI-M-11, 21, and 31 (LPSI loop stops).

27. During normal at-power operations, the letdown monitor (RI-3102) counts are trending upward. Chemistry has notified Operations that primary system samples indicate several fuel rods may have failed. Your actions to determine the extent of fuel damage and minimize radiation levels are based on:

A. Excessive fission products in the reactor coolant system which may inhibit the heat transfer surfaces in both the S/G and reactor core.

B. Protection of the health and safety of the public per 10 CFR 100 in the event of a steam generator tube rupture.

C. Protective action guidelines per the Emergency Plan that are required to be pre-scripted during a fuel failure scenario in the event of evacuation.

D. Known limitations with the current radiation monitoring circuitry to effectively chart increases in RCS activity.

28. A total loss of all AC power has occurred and the operating crew has entered ECA-0.0, "Loss of All AC Power." The secondary side NPO reports that DG-1A is running, but control room attempts to close the DG-1A breaker have failed. Which statement describes the next operator action that should be performed?

A. Attempt to close the DG-1A breaker at the breaker.

B. Immediately start PCC and service water pumps.

C. Provide an alternate source of cooling water to DG-1A.

D. Secure DG-1A until cause of breaker failure is determined.

29. During a LOCA, the safety injection tanks will inject borated water into the RCS. At some point with wide range Thot <345 °F, the SITs are required to be isolated. If the SIT's are NOT isolated when required, then you would be unable to:

A. Guarantee reflux cooling as a heat removal option due to gas binding in the tube bundle region.

B. Restart the RCP's because the seal cavity would need to be vented prior to use.

C. Verify the two-phase level in the reactor vessel via the primary inventory trend system (PITS).

D. Control RCS pH because the nitrogen will form nitric acid in the RCS.

30. Main steam line vents (MS-48, 68, and 88) are listed in Technical Specification 3.11, "Containment," as exceptions for containment integrity manual valves. These valves are allowed to be opened when RCS temperature is greater than 210 °F. What is the basis for allowing these valves to be opened?

A. These valves can be cycled open frequently during plant operations.

B. These valves can be opened to provide vacuum assist to the non-return valves during plant cooldown.

C. These valves can be opened during heatup for several hours when the RCS is between 210 °F and 300 °F.

D. These valves can be cycled open briefly during steam line warmup to blowdown the steam traps.

31. The plant is at 55% power during CEA testing. A voltage spike affecting both timer module power supplies causes a Group 5A rod to drop. How long does the operator have, per Technical Specifications, to correct the rod misalignment?

A. The operator must immediately correct the rod misalignment.

B. The operator has 15 minutes to correct the rod misalignment.

C. The operator has 30 minutes to correct the rod misalignment.

D. The operator has 1 hour to correct the rod misalignment.

32. The plant is at HFP. During inspections it is discovered that the reactor trip breaker manual pushbutton wiring is not in compliance with the IEEE standard. What action is required?

A. Place the reactor in hot standby within six (6) hours and in hot shutdown in the following thirty (30) hours.

B. Attempt to repair in the next seventy-two (72) hours (as allowed by the remedial action statement).

C. Commence a reactor shutdown within one (1) hour and place the plant in hot shutdown within six (6) hours.

D. Immediately trip the reactor via the ATWS/DSS pushbuttons and be in cold shutdown within six (6) hours.

33. The reactor is at 10% power (EOL) and ready for turbine testing. The following conditions exist:

- Turbine bypass valves in AUTOMATIC, set at 825 psig;
- Group 5A and 5B rods at 140 steps;
- Turbine tripped;
- NI and delta T power indicate 10% power;
- T cold is approximately 527 °F.

Reactor Engineering has requested that Group 5A and 5B rods be borated to the ARO position. After initiating the required boric acid batch addition the RO selects manual sequential rod control and moves Group 5A and 5B rods out. When the IN-HOLD-OUT switch is released, the rods continue to withdraw. What is the plant response without any further operator action?

A. The rods continue to withdraw until they reach the upper electrical limit. The negative MTC turns power and power stabilizes at approximately 10%.

B. The rods continue to withdraw until the power range Level 1 bistable is enabled. The plant trips at 15% power because the turbine is tripped.

C. The rods continue to withdraw until an NI/delta T power channel deviation occurs. The boration turns power but power eventually stabilizes at 10%.

D. The rods continue to withdraw until the wide range Level 1 bistable is enabled. A CEA withdrawal prohibit signal will stop the rod motion.

34. An emergency boration of the RCS is required following entry into FR-S.1, "Nuclear Power Generation/ATWS." Which of the following flowpath actions will meet FR-S.1 criteria for emergency boration?

A. Verify a charging pump operating, open HSI-M-50 and 51, take LD-A-51 to "PDT", start two boric acid transfer pumps.

B. Start two boric acid transfer pumps, maximize charging flow, verify a charging pump operating, close CH-M-1.

C. Start two boric acid transfer pumps, increase auxiliary charging pump (P-7) flow to at least 15 gpm, close CH-M-87, open BA-M-36 and 37.

D. Verify a charging pump operating with CH-F-38 open, start two boric acid transfer pumps, open BA-M-36 and 37, close CH-M-87.

35. While in Tc coastdown, a transient causes a drop in temperature. The plant stabilizes from the transient with Tcold at 498.5 °F. What is your response to this condition as the Shift Operating Supervisor?

A. Restore Tcold to >500 °F by lowering power level or commence a reactor shutdown within one hour.

B. Restore Tave to >500 °F by lowering power level or commence a reactor shutdown within one hour.

C. Maintain Tave at its present value as this is allowed during coastdown operations.

D. Immediately trip the reactor, as recovery of system temperature will cause significant xenon oscillations.

36. In preparation for restoring AC power following a total loss of AC, ECA-0.0, "Loss of All AC Power," requires the operator to place most MCB operated plant equipment in PULL-TO-LOCK except for the PCC and SCC pumps, where one of each is left in AUTO. Why are the PCC and SCC pumps left in AUTO?

A. To supply immediate cooling water to the RCP seal in order to minimize seal damage.

B. To provide immediate loading on the EDG in order to prevent overspeed.

C. To supply immediate cooling for the RHR heat exchangers to continue plant cooldown.

D. To allow for immediate cooling of the EDG to prevent overheating.

37. During verification of natural circulation conditions, the primary side RO reports that core region subcooled margin monitor is not available for operator use. Which of the following would provide the best indication of natural circulation flow?

A. S/G pressure, Pressurizer level, Thot, and CET's.

B. S/G pressure, Pressurizer pressure, Tcold, and CET's.

C. RCS pressure, Pressurizer level, Thot, and CET's.

D. RCS pressure, S/G level, Tcold, and CET's.

38. The plant has experienced a LOCA with failed fuel. The containment spray system is operating in the recirculation mode. RHR heat exchanger tube leaks have spread contamination throughout the PCC and SCC systems. Chemistry wants to increase the recirculation flow rate through the PCC and SCC chemical addition tanks to > 20 gpm (bypassing the heat exchangers) to facilitate degassification. Why is this situation undesirable?

A. It could lead to an unmonitored release via the off-gas filters and primary vent stack.

B. Increased degassification with residual system chromates can form chromic acid which will accelerate piping corrosion.

C. Inadequate PCC/SCC flow through the PCC and SCC heat exchangers could violate conditions in the accident analysis.

D. The PCC/SCC surge tanks become a point source for radiation in an uncontained and unshielded area of the plant.

39. During an emergency boration in accordance with FR-S.1, "Nuclear Power Generation/ATWS," the operator is required to verify that pressurizer pressure is less than 2385 psig. Why is this action required?

A. To ensure sufficient negative reactivity addition rates while using the charging pump (P-14 A/B) for emergency boration.

B. To ensure sufficient negative reactivity addition rates while using the auxiliary charging pump (P-7) for emergency boration.

C. To prevent a feed and bleed situation which requires exiting FR-S.1 and entering FR-H.1, "Loss of Heat Sink."

D. With pressure greater than 2385 psig, the Diverse Scram System (DSS) is actuated which impedes boric acid flow into the RCS.

40. A main steamline elbow upstream of the #2 non-return valve breaks while at 100% power and results in entry into E-O, "Reactor Trip or Safety Injection." An operator finds all three blowdown valves (BD-T-12, 22 and 32) still open when verifying ECCS valve alignment. Further analysis indicates that the HELB blowdown valves (BD-T-141 thru 146) are also open. Why is this condition a concern for this accident situation?

A. BD-T-141 thru 146 should have closed on the SIAS/CIS signal to preserve feedwater for decay heat removal.

B. BD-T-12, 22, and 32 should have closed on the SIAS/CIS signal to preserve feedwater for decay heat removal.

C. BD-T-12, 22, and 32 should have closed on low S/G level to prevent an excessive cooldown and possible return to criticality.

D. BD-T-141 thru 146 should have closed on low S/G level to prevent an excessive cooldown and possible return to criticality.

41. The "A" traveling water screen has failed due to high differential pressure. The "A" condenser waterbox has been removed from service to clean debris off the inlet tube sheet. An operator verifying valve alignment inadvertantly shuts the "B" waterbox outlet to the vacuum priming tank causing condenser differential pressure to rise. What actions should be taken to prevent turbine damage?

A. Continue to monitor condenser differential pressure and manually trip the turbine when this value is greater than 3.5" Hg.

B. Place the EJ-2A and B condenser hoggers in service to minimize the main condenser differential pressure.

C. Monitor directional thrust on the main turbine shaft and manually trip the turbine if thrust is excessive.

D. Monitor turbine supervisory instrumentation until turbine vibrations exceed the 18 mil setpoint for safe operations, then trip the turbine.

42. Which of the following indications could be used to differentiate between an actual low pressurizer level and a low failure of the "in-service" pressurizer level control channel?

A. All heaters are de-energized.

B. Standby charging pump in "AUTO" starts.

C. Minimum letdown flow is indicated on the letdown flow controller.

D. Maximum charging flow is indicated on the charging flow controller.

43. During CEA exercising (Surveillance Proc. 3-1-8) a group 5 CEA drops into the core while at 80% power. The operators employ the "long term-slow recovery" method to restore the dropped rod per AOP 2-21, "Misaligned (dropped) CEA", because of problems with that rod's power supply. Why is power reduced in this situation?

A. Power reductions prior to rod recovery control xenon oscillations and symmetric offset limits.

B. Power reductions prior to rod recovery minimize flux peaking and limit pellet clad interactions.

C. Power reductions prior to rod recovery increase the allowed KW/FT value and decrease the allowed FRT limit.

D. Power reductions prior to rod recovery eliminate the need for additional boration.

44. While at 100% power, high vibration alarms are received on #3 RCP. While investigating the alarm locations on the RCP vibration monitor, the reactor trips on low flow.

- The green and amber lights on #3 RCP control switch are lit;
- The 86 device (86 P-1-3) on the breaker cubicle is "tripped";
- Overcurrent devices on two phases (51-A and 51-C) on #3 RCP are tripped.

What is the probable cause and effect of this event?

A. An RCP seized rotor and challenge to the fuel centerline melt safety limit.

B. An RCP sheared impeller and challenge to the DNBR safety limit.

C. An RCP seized rotor and challenge to the DNBR safety limit.

D. An RCP sheared impeller and challenge to the fuel centerline melt safety limit.

45. The reactor has tripped from a total loss of offsite power and the emergency diesels (DG-1A and 1B) are operating and supplying their respective emergency buses. Breakers 1R, 2R, 3R, and 4R are "green flagged open" and breakers 1U, 2U, 3U, and 4U are "red flagged open". Undervoltage lockout relays 27Y-5 and 27Y-6 cannot be reset. What action is necessary to reset these relays?

A. Breakers 3R and 4R must be placed in "PULL-TO-LOCK" before the 27Y-5 and 27Y-6 relays will reset.

B. Breakers 3U and 4U must be placed in "PULL-TO-LOCK" before the 27Y-5 and 27Y-6 relays will reset.

C. Breakers 1R and 2R must be placed in "PULL-TO-LOCK" before the 27Y-5 and 27Y-6 relays will reset.

D. Breakers 1U and 2U must be placed in "PULL-TO-LOCK" before the 27Y-5 and 27Y-6 relays will reset.

46. What are the possible adverse consequences to the containment spray valves (CS-M-1&2) if offsite power is in a degraded voltage condition?

A. The MOV's may develop insufficient torque to start valve movement.

B. Adequate voltage will not be available to the control power circuit to operate the 42 device in-line contactors.

C. The motors may operate at a slower than acceptable speed as outlined in the accident analysis.

D. DC control power will close the breakers but the motors may be unable to open the valves.

47. Which of the following conditions will result in a boration of the RCS?

A. Placing the makeup mode selector switch in "BORATE" with the boric acid flow control valve (BA-F-30) set at 0 gpm and CH-F-38 in "AUTO."

B. Placing an emergency boration valve switch (BA-M-37) in "OPEN" with VCT pressure at 20 psig while on normal letdown with CH-F-38 in "AUTO."

C. Placing an emergency boration valve switch (BA-M-37) in "OPEN" while on alternate letdown with CH-M-87 shut and CH-F-38 in "AUTO."

D. Placing the boric acid flow control valve (BA-F-30) at 15 gpm with the makeup mode selector switch in "DILUTE" and CH-F-38 in "AUTO."

48. The S/G wide range channel is being used to control S/G level during a plant cooldown. With containment temperature at 90 °F, S/G pressure at 300 psig, and indicated wide range level at 300", what is the actual level in the S/G? (Use the attached figure)

A. 260"

B. 312"

C. 350"

D. 400"

49. The plant is at 50% power when a Train "A" HELB signal is actuated in the PAB. Which of the following calculations/systems would be directly or indirectly affected by Train "A" HELB actuation?

A. MWth, HV-7 heating steam, and VCT level.

B. MWth, seal water temperature, and PAB general area ventilation (FN-2).

C. S/G radiation monitors, MWth, and BWST heating.

D. Letdown radiation monitor, MWth, and Spray Building pressure.

50. While maintaining a hot shutdown condition, the #1 RCP seal water return flow high alarm is received and the operator has indications that all three seals are failed. The operator notes that the #1 RCP seal water return indication on the MCB is pegged high and the other two RCP's seal water return flows are <1 gpm. How does this condition effect the operation of the #1 RCP?

A. The #1 RCP may remain operating but the seal water return valve (SL-M-29) should be closed.

B. As long as seal water injection flow is greater than seal water return flow, the #1 RCP may continue running.

C. The #1 RCP must be immediately secured and the seal water supply valve (SL-F-22) closed.

D. The #1 RCP should be tripped and the seal water return valve (SL-M-29) closed.

51. The plant is in a mini-outage to conduct fuel sipping operations in the spent fuel pool (SFP). While moving an assembly in the SFP a spent fuel pool area monitor radiation alarm is received. What action occurs as a result of this alarm?

A. The upender cannot be raised in the SFP.

B. The new fuel elevator upward motion is inhibited.

C. The SFP ventilation system is automatically shut down.

D. The SFP crane trolley movement is inhibited.

52. Prior to operating the boron recovery system (EV-1) to process hydrogenated waste from the PDT, the degasifiers are run to remove hydrogen and other radioactive gases. How is oxygen instrusion into the waste gas system prevented when the degasifier system has cooled down and is in standby?

A. The degasifier on-line vents remain open to allow the waste gas surge tank to float on the degasifiers.

B. The degasifier vent cooler bypasses open to allow the waste gas surge tank to float on the degasifiers.

C. The degasifier vent cooler bypasses open to allow the in-service waste gas decay drum to float on the degasifiers.

D. The degasifier on-line vents remain open to allow the in-service waste gas decay drum to float on the degasifiers.

53. The plant has tripped on a low steam generator pressure signal followed by EFCV closure due to a catastrophic failure of the main steam header in the turbine hall. In order to open the #2 S/G main feed regulating valve, the operator must:

A. Bypass both trains of feed water isolation and reset the turbine trip signal.

B. Bypass one train of feed water isolation or reset the turbine trip signal.

C. Bypass both trains of feed water isolation and press the "Steam Dump Override" push button.

D. Bypass one train of feed water isolation and reset the turbine trip signal.

54. While at 100% power with P-2C in service, the P-2C recirculation valve fails wide open. How does the condensate system respond?

A. The standby condensate pump auto starts on low feed pump discharge pressure.

B. The standby condensate pump recirculation valve closes.

C. The condensate gland exhaust condenser bypass valve opens.

D. The standby condensate pump auto starts on low feed pump suction pressure.

55. The computer room air conditioners are unable to maintain computer room temperature and a manual shutdown of the plant computer is required. In an effort to verify Technical Specification 3.9, how can the operator read CET temperatures?

A. Access the Remote Instrumentation Room, use a calibrated thermometer, disconnect leads at measuring junction, read CET temperatures.

B. Access the Reactor MCC Room, use a calibrated thermometer, disconnect leads at measuring junction, read CET temperatures.

C. Access the Computer Room, use a calibrated thermometer, disconnect leads at reference junction, read CET temperatures.

D. Access Reactor MCC Room, use a calibrated thermometer, disconnect leads at reference junction, read CET temperatures.

56. The plant has experienced a small break LOCA during a station blackout and P-25B, the turbine driven AFW pump, is unable to provide feed flow. Core temperatures are rising along with pressurizer pressure with an average CET temperature of 750 °F and pressurizer pressure of 1800 psia. The core region subcooled margin monitors will:

A. Continuously flash a -129 °F indication on MCB Section "B."

B. Continuously flash a +129 °F indication on MCB Section "B."

C. Continuously flash a -75 °F indication on MCB Section "B."

D. Continuously flash a -50 °F indication on MCB Section "B."

57. The plant is operating at 80% power when an RPS calibration is performed based on the "steam flow" calorimetric. As power is returned to 100%, steam flow power indication is less than delta T power indication. Why does this occur?

A. The auxiliary steam loads at 80% power were not accounted for in the steam flow calorimetric.

B. The steam flow calorimetric introduces an overly conservative value for power level when at 80%.

C. The hotter water when greater than 80% power has increased neutron leakage and the RPS NI detectors now see more neutrons.

D. The delta T power instrument was not recalibrated for the higher Tcold value at 100% power.

58. The wide range logarithmic channels each have three (3) fission chambers per detector. The source range nuclear instruments utilize all three (3) fission chambers while the wide range nuclear instruments use only one (1) fission chamber. If the fission chamber that feeds the wide range instrument fails low on a power increase, that channel's output would:

A. Lower the CPS output in the source range and slightly lower the value at which the Level 1 (2%) and Level 2 (10-4%) bistables are actuated.

B. Not affect the CPS output in the source range, but will prevent the Level 1 and 2 bistables from actuating at 2% and 10-4% respectively.

C. Lower the CPS output in the source range and will prevent the Level 1 and 2 bistables from actuating at 2% and 10-4% respectively.

D. Not affect the CPS output in the source range and slightly lower the value at which the Level 1 (2%) and Level 2 (10-4%) bistables are actuated.

59. Following a steam line break accident the SI termination procedure (ES-1.1) calls for throttling of HPSI flow before resetting SIAS. How is HPSI flow throttled in this condition?

A. HSI-M-41 and 42 NORMAL/BYPASS keys to BYPASS; HSI-M-11, 12, 21, 22, 31, and 32 throttled as necessary.

B. HSI-M-41 and 42 NORMAL/BYPASS keys to NORMAL; HSI-M-41 and 42 throttled as necessary.

C. HSI-M-41 and 42 NORMAL/BYPASS keys to BYPASS; HSI-M-41 and 42 throttled as necessary.

D. HSI-M-41 and 42 NORMAL/BYPASS keys to NORMAL; HSI-M-11, 12, 21, 22, 31, and 32 throttled as necessary.

60. The following conditions exist:

- PAB ventilation exhaust fan (FN-2) has tripped;
- Containment gas monitor (RM-6102Y) is in alarm;
- Primary vent stack gas monitor (RM-3902Y) is in alarm;
- Containment ventilation supply fan (HV-9) has tripped;
- VP-A-1, 2, 3, 4, & 5 have tripped closed.

Which scenario would be responsible for these conditions and alarms?

A. A containment "refueling" purge was in progress.

B. A containment "on-line" purge was in progress.

C. The waste gas surge tank has ruptured in the PAB upper level.

D. The loop seal between the waste gas surge tank and the primary vent stack was lost.

61. During maintenance of battery bus #3 (disconnected from the bus), a loss of DC bus #3 occurs (the vital AC bus is still available). The plant does not trip. The RO reports that one PORV (PR-S-15) and its associated block valve (PR-M-17) are energized and one (1) set of proportional heaters (E-2PB) are deenergized. Do you concur with the analysis of this situation? Why?

A. Yes, because you verify that the indicating lights for E-2PB are off and the lights for PR-S-15 and PR-M 17 are on.

B. No, because if E-2PB has lost its indication, then PR-S-15 and PR-M-17 should also have lost their indications.

C. Yes, because PR-S-15 and PR-M-17 retain DC control power on a loss of DC bus #3.

D. No, because the proportional heaters have lost indication only. The E-2PB breaker is still closed.

62. The reactor is being started up following an extended refueling outage. The fission chambers swap from CPS to % PWR at 1000 cps and 10-6% power respectively. If the reactor must be shutdown after critical rod data is obtained, what relationship exists between CPS and % PWR indication as the reactor enters the source range?

A. Counts per second (cps) and % power have no relationship because of the number of detectors used by the source and wide range instruments.

B. Counts per second (cps) and % power are inversely related, that is 10-6% power equals 1000 cps; 10-7% power equals 10 cps, etc.

C. Counts per second (cps) and % power are directly related, that is, 10-6% power equals 1000 cps; 10-7% power equals 100 cps, etc.

D. Counts per second (cps) and % power are inversely related, that is, 10-6% power equals 1000 cps; 10-7% power equals 100 cps, etc.

63. The following conditions exist during a refueling outage with the plant in Condition 3, cold shutdown:

- The RCS is at the refueling boron concentration;
- The "A" diesel generator (DG-1A) is tagged out for maintenance;
- The RHR pumps are available, but isolated for recirculation tests;
- X-16 is tagged out for verification of transformer taps;
- Pressurizer level is 85%.

Chemistry and operations have decided to reduce the RCS boron concentration to the cold shutdown requirement. What actions are required before reducing RCS boron concentration?

A. An RHR pump must be aligned to the RCS providing a minimum 2000 gpm flow.

B. Place letdown in service with a minimum 40 gpm flow.

C. X-16 must be aligned to a 6900 volt bus and an RCP started.

D. The charging pump (P-14B) must be aligned to the RCS and providing a minimum 150 gpm flow of borated water.

64. The VCT vent valve (PV-A-2) fails to close following routine burping of the VCT. Both waste gas compressors (C-3A & 3B) are out of service. Identify the group of radiation monitors that follows the flowpath of radioactive gas to atmosphere.

A. From the high range PVS gas monitor (RM-3903), to PVS gas monitor (RM-3902Y), to Service Building ventilation exhaust (RM-6101).

B. From the waste gas monitor (RM-3901), to PVS particulate monitor (RM-3902X), to PVS gas monitor (RM-3902Y).

C. From the Service Building ventilation exhaust (RM-6101), to PVS particulate monitor (RM-3902X), to waste gas monitor (RM-3901).

D. From the PVS gas monitor (RM3902Y), to high range PVS gas monitor (RM-3903), to PVS particulate monitor (RM-3902X).

65. The plant has tripped on a main steam header rupture in the turbine hall. The EFCV's have closed and steam generator pressures are hovering around 400 psig. What must be done to open the EFW butterfly valves?

A. Place the excess flow check valves in the "CLOSED" position.

B. Place the EFW-A-338, 339, and 340 "NORMAL/ALTERNATE" T-switch in the EFW pump room to "ALTERNATE."

C. Verify adequate instrument air pressure in the receivers in the EFW pump room so that the valves will open.

D. Manually open the EFW butterfly valves (EFW-A-338, 339, and 340) from the EFW pump room.

66. An operator controlled cooldown (with an RCP running) has been initiated during a steam generator tube rupture by dumping steam at the maximum rate to the main condenser. RCS depressurization is also occuring and results in a core region subcooling reading of 10 F. What action should be taken at this time?

A. Continue the operator-controlled cooldown and keep the RCP running.

B. Stop the cooldown and restore subcooled margin before continuing.

C. The RCP should be tripped on low core region subcooling as long as one charging/HPSI pump is in service .

D. Stop RCS depressurization to restore subcooled margin before continuing.

67. A #3 steam generator tube rupture is in progress and the plant has been cooled and depressurized to minimize RCS flow into #3 S/G. At this time, the operator is required to check #3 S/G pressure to determine if it is stable or increasing. It is determined that the ruptured steam generator is continuing to lose pressure and cannot be maintained 250 psig greater than the intact S/G's. Why is the ruptured S/G pressure continuing to decrease?

A. #3 S/G has multiple tube ruptures which is causing pressure in the S/G to decrease.

B. The intact S/G's were overcooled and the high pressure in #3 S/G is backfeeding into the RCS.

C. When safety injection was blocked in the preceding steps, the operator did not maintain RCS temperature stable.

D. #3 S/G is also undergoing a steam or feedline break (faulted).

68. The reactor is cooling down with the "A" RHR pump and the "A" RHR heat exchanger in service. The "B" RHR pump and the "B" RHR heat exchanger are operable and in standby. The RCS is not yet adequately vented per OP 1-7, "Plant Cooldown." PORV "A" VPSR setpoint fails high. The "A" train PORV (PS-S-14) immediately opens. What action is required?

A. Shut PR-M-16, determine the cause of the PORV opening and align the RWST to the RHR pump to compensate for lost inventory.

B. Shut PR-M-16, start the "B" train RHR pump (P-12B) and align SCC to E-3B in order to maintain core cooling.

C. Shut PR-M-16, stop P-12A because RH-M-1 closes, then align an alternate flowpath for core cooling.

D. Shut PR-M-16, open RH-T-12 and LSI-F-59 to the full open position to facilitate venting of RHR piping and valves to RCS.

69. An operator has been sent to the lower level PAB to start the auxiliary charging pump (P-7) during a control room evacuation. The pump was aligned as follows:

- The speed control lever is set on the lowest speed;
- The pump is running with no abnormal noises with the RCS at normal operating pressure and temperature.

The PSS at the ASP notes that PZR level has not increased for 15 (fifteen) minutes. What is the cause of this problem?

A. The alternate cooler for P-7 was not aligned and the hydraulic oil is overheating.

B. The setpoint on CH-P-156 needs to be adjusted up to 2335 psig.

C. The speed control needs to be adjusted to the high speed setting.

D. The RCS must be depressurized using the atmospheric steam dump before a level increase will be seen.

70. The plant has experienced a small break LOCA and containment pressure has stabilized at 6.5 psig. The ECCS lightbox indication for PCC-M-219 shows BOTH the blue and green lights flashing. A check of PCC-M-219 on the MCB shows both the red and green valve position lights lit. In this condition PCC-M-219 is:

A. Completing its closure stroke and will indicate a green "closed" light in a few moments.

B. Completing its opening stroke and will indicate a red "open" light in a few moments.

C. Without AC control power due to inadvertant opening of the MCC-7B supply breaker.

D. Tripped on overload and may require manual actions to close the valve.

71. Your crew is performing actions during a small break LOCA. You have transitioned from E-O, "Reactor Trip or Safety Injection," to E-1, "Loss of Primary or Secondary Coolant," and are checking to see if HPSI flow should be reduced. Several parameters, such as core region subcooling, secondary heat sink, pressurizer pressure and level must be satisfied. If you were to misdiagnose secondary heat sink availability and entered ES-1.1, "SI Termination," how could this effect your recovery actions?

A. Because HPSI flow could be maintaining core region subcooling, when flow is reduced the lack of heat removal could require reinitiation of the HPSI flow.

B. Because core region subcooling is the most direct indication that core cooling is being maintained, it is unlikely that the recovery actions will be inhibited by inadequate heat sink.

C. Because pressurizer RCS pressure and level are satisfied, the break size is such that in reduced HPSI flow conditions, there will always be sufficient RCS inventory for core cooling.

D. Because HPSI flow could be maintaining core region subcooling, when flow is reduced the lack of heat removal could require entry into FR-C.1, "Inadequate Core Cooling."

72. During the feed and bleed termination sequence of FR-H.1, "Loss of Secondary Heat Sink," throttling of HPSI flow to less than 150 gpm is required. Why is HPSI flow throttled during the termination sequence?

A. To ensure HPSI flow is adequate to remove decay heat even without a steam generator available.

B. If HPSI flow cannot be throttled the operator would be required to exit FR-H.1 and enter E-3, "Steam Generator Tube Rupture."

C. With HPSI flow throttled to less than 150 gpm, the normal charging flow path will be able to meet RCS inventory requirements.

D. Because the PORV's must be closed before the operator can exit FR-H.1 in the event of a subcriticality or core cooling red path.

73. Reactor trip breaker positions are shown on the attached drawing. Which statement identifies the most likely result if TCB-2 and TCB-6 are immediately reclosed?

A. The reactor trips due to loss of power to the output AC contactors.

B. The reactor remains operating due to redundant CEDM power supplies.

C. The reactor trips due to improper paralleling of MG sets.

D. The reactor remains operating due to automatic synchronization.

74. The reactor has tripped from 100% power due to a loss of feedwater. In an effort to restore feed flow to a S/G following a reactor trip, the operator is cautioned in FR-H.1 to verify that blowdown flow has been secured. Blowdown flow should have been isolated by:

A. Automatic action from the diverse scram system (DSS).

B. Automatic action on a low S/G level (35%).

C. Automatic action on a diverse turbine trip (DTT).

D. Automatic action on a low S/G pressure.

75. The reactor is on an RHR cooldown with the RCS at 150 °F and 200 psig. Several trash rack and traveling water screen differential pressure alarms are received while at low tide. The AO reports large quantities of debris in front of the trash racks and the service water pump amps and discharge pressures are oscillating. Both PCC and SCC temperatures are rising. There is no firm estimate of the time it will take to restore service water. In this condition the operator will:

A. Align firemain hoses to the PCC and SCC heat exchangers to maintain RCS temperature until service water is restored.

B. Prepare a steam generator heat removal loop for operation and allow the RCS to heat up to allow dumping steam.

C. Align the charging pump to the RWST and windmill water through the LPSI pump and RHR heat exchangers with RWST as heat sink.

D. Align the NRV vacuum assist and bleed steam to the condenser until service water is restored.

76. During routine sampling of the in-service waste gas decay tank, the shift chemist reports concern that hydrogen concentration (by volume) is 6% and oxygen concentration (by volume) is 4.5%. What actions should be taken upon receipt of this information?

A. Verify the waste gas area radiation monitor is reading background and not in alarm; evacuate personnel from the PAB; immediately stop any additions to the waste gas tank.

B. Immediately suspend additions to the waste gas surge tank; notify the primary AO of problems with gas concentration; continue monitoring by chemistry and reduce hydrogen concentration when it exceeds 8% (by volume).

C. Evacuate personnel from the PAB; suspend additions to the waste gas tank; take immediate action to reduce the oxygen concentration to less than 4% (by volume).

D. Evacuate personnel from the PAB; suspend additions to the waste gas tank; take immediate action to reduce the hydrogen concentration to less than 2% (by volume).

77. The reactor is just critical when the plant computer shuts down. The operator is required to verify compliance with an NRC ordered 2 psig containment pressure limit. Which of the following Control Room instrumentation is available to meet the containment integrity limits?

A. The mensor quartz manometer indication (PIT-2021).

B. The volumetrics containment pressure instrument indication (PIT-2020).

C. Post accident wide range containment pressure instrument (PI-2012).

D. Narrow range containment pressure instrument (PT-2085).

78. The SFP demineralizer (I-4) has just received a fresh charge of unborated H-OH resin and has been improperly placed in service. Over the next several hours:

A. SFP 15 minute gross gamma should decrease, boron concentration should increase, and negative reactivity in the SFP should increase.

B. SFP 15 minute gross gamma should decrease, boron concentration should decrease, and negative reactivity in the SFP should increase.

C. SFP 15 minute gross gamma should increase, boron concentration should increase, and negative reactivity in the SFP should decrease.

D. SFP 15 minute gross gamma should decrease, boron concentration should decrease, and negative reactivity in the SFP should decrease.

79. In preparation for core off loading, the upper guide structure (UGS) is being removed from the reactor vessel. As the bottom of the UGS clears the reactor vessel a camera detects a fuel assembly stuck to the bottom of the UGS. As SRO in charge of refueling, you should:

A. Immediately reinsert the UGS while monitoring the load cell in the event the fuel assembly is wedged.

B. Maintain the UGS in position and seek Operations and Engineering department assistance.

C. Continue withdrawing the UGS and position the bottom of the assembly over the reactor vessel lip.

D. Lower the UGS approximately six feet and nudge it with the polar crane to dislodge the assembly.

80. Which one of the following statements describes the primary plant indication of a loss of RHR flow due to a loss of RCS inventory while the RCS is in a mid-loop configuration?

A. Fluctuating RHR pump amps, lower reactor vessel level indication, and decreasing LSI-F-59 flow indication.

B. Oscillating RHR pump amps, fluctuating charging pump discharge pressure, and decreasing LSI-F-59 flow indication.

C. Decreasing RHR pump amps, lower reactor vessel level indication, and increasing LSI-F-59 flow indication.

D. Increasing RHR pump amps, increasing charging pump discharge pressure, and fluctuating LSI-F-59 flow indication.

81. The following conditions exist when in hot shutdown:

- PAB upper level ambient temperatures are >130 F,
- RCS temperature is being maintained via AS-P-3 and MS-A-162 opening;
- CH-F-38 flow is increasing with charging header pressure decreasing;
- Main steam non-return valves (MS-M-10, 20 and 30) are closed;
- Blowdown is aligned to the primary vent stack;
- A four times normal radiation level spike was recorded on the PVS gas monitor (RM-3902Y).

Initial discussion among the crew seems to indicate that a steam generator tube leak may be in progress. What mechanism should the operator use to confirm the S/G tube leak?

A. Allow a few minutes to pass then note any increasing radiation levels on the blowdown monitors.

B. Use the main steam line monitor to note any increasing radiation level trends.

C. Continue trending the PVS radiation level and off-gas filter radiation levels.

D. Monitor the steam generator levels and EFW flow.

82. A plant cooldown is in progress. The #1 and #2 S/G EFCV switches have been placed in "OPEN," #3 EFCV switch was inadvertantly left in "AUTO." Which of the following statements identifies plant response on decreasing steam generator pressure?

A. When 2/4 steam generator pressures in #3 S/G are <400 psig, all EFCV's will close.

B. When 4/4 steam generator pressures in #3 S/G are <400 psig, only #3 S/G's EFCV will close.

C. When 2/4 steam generator pressures in #3 S/G are <400 psig, only #3 S/G's EFCV will close.

D. When 1/4 steam generator pressures in #3 S/G are <400 psig, all EFCV's will close.

83. How are radiation levels trended inside the containment during an accident that releases large amounts of radionuclides?

A. The high range radiation monitors (RM-6113A/B) have chart recorders that are automatically activated.

B. The high range radiation monitors (RM-6113A/B) have chart recorders that are manually activated.

C. The manipulator crane radiation monitor (RM-6104) has a chart recorder that is automatically activated.

D. The high range radiation monitors (RM-6113A/B) automatically activates a historical record on the plant computer.

84. Which of the following, when at hot full power, would be designated as an Operator Workaround?

A. The north entrance to the steam and valve house is temporarily blocked by scaffolding in the Reactor MCC Room.

B. An operator is stationed at the feedwater section of the MCB to manually control #1 S/G main feed regulating valve for 15 minutes.

C. Train "A" CIS annunciator for "Trip Signal: RCP Trip Criteria" is continuously lit on the MCB annunciator panel.

D. The MCB switch for the diesel fire pump (P-5) is being replaced due to a design deficiency (auto-start is available).

85. A containment recirculation fan power supply change was necessitated due to a LOCA scenario. Which of the following describes the change(s) made to prevent diesel generator overload?

A. FN-17-2, 4, and 6 were moved from BUS 8 and are powered from MCC-9C located in the protected switchgear room.

B. FN-17-1, 3, and 5 were moved from BUS 7 and are powered from MCC-9C located in the protected switchgear room.

C. FN-17-2, 4, and 6 were moved from BUS 8 and are powered from MCC-9C located in the unprotected switchgear room.

D. FN-17-1, 3, and 5 were moved from BUS 7 and are powered from MCC-9C located in the unprotected switchgear room.

86. An on-line purge of containment is in progress. During your control board walkdown, you note that the valve position indications for VP-A-1, 2, 3, and 5 are both lit (red and green indications on). What would this condition indicate?

A. That a high containment gas or PVS gas radiation level alarm has just cleared and the valves are traveling to the full open position.

B. That a containment low range or manipulator crane alarm was just received and the valves are traveling to the closed position.

C. That a purge is about to begin as soon as the valves reach their full open position.

D. That a purge is in progress and all four (4) valves are positioned according to procedural restrictions.

87. Following a load rejection anticipated operational occurrence (AOO), the reactor fails to trip on signals generated by the reactor protection system. What backup system will provide core protection during the AOO?

A. Diverse turbine trip (DTT) on low S/G level two (2) out of two (2), energizing 20 AST and dumping auto-stop oil.

B. Diverse scram system (DSS) on low S/G water level two (2) out of two (2), opening M/G set output breakers.

C. Diverse scram system (DSS) on high pressurizer pressure two (2) out of four (4), opening M/G set output breakers.

D. Diverse scram system (DSS) on high pressurizer pressure four (4) out of four (4), opening M/G set output breakers.

88. A plant trip occurs on low S/G level near the end of cycle. The operator notes increasing counts on the letdown radiation monitor (RM-3102). The demineralizer bypass valve (LD-T-36) is open (to demineralizer), but the letdown pressure control valve (LD-F-16) has automatically closed. The VCT cubicle area radiation levels have increased. What is the probable cause of this event?

A. A crud burst has occurred and caused LD-F-16 to close on high pre-filter D/P.

B. A fuel failure has occurred and caused LD-F-16 to close on high demineralizer D/P.

C. A crud burst has occurred and caused LD-F-16 to close on high demineralizer D/P.

D. A letdown drag valve has failed open and caused LD-F-16 to close on high pre-filter D/P.

89. A loss of secondary heat sink has occurred. The reactor head subcooled margin monitor is reading 10 °F and is decreasing. As the reactor head subcooled margin monitor approaches 0 F, pressurizer level indication will:

A. Increase due to voiding in the PZR heater area.

B. Increase due to voiding in the S/G tube bundle region.

C. Increase due to voiding in the reactor vessel.

D. Increase due to voiding in the PZR reference leg.

90. Which of the following groups of indications, trips, and alarms will be effected if any one pressurizer pressure safety channel is lost (PT-102 A, B, C, or D)?

A. High pressure trip unit, PORV block valve auto open, diverse scram system.

B. TM/LP trip unit, SIAS actuation, LO-LO pressure alarm.

C. SPDS input, SIAS actuation, low pressure heater cutout.

D. PORV actuation, diverse turbine trip, high pressure trip unit.

91. The spare containment spray pump (P-61S) is aligned as a "B" train LPSI pump during normal operations. A total loss of offsite power and SIAS actuation signals are initiated due to a seismic event. How does P-61S respond during this transient?

A. P-61S starts immediately due to 27Y-5 actuation.

B. P-61S starts on time delay due to 27Y-5 actuation.

C. P-61S starts immediately due to 27Y-6 actuation.

D. P-61S starts on time delay due to 27Y-6 actuation.

92. Which of the following describes the method used to to ensure the SIT isolation valves (SIA-M-11, 21, and 31) are available for use during Condition 7 operations?

A. The MOV's have a breaker and disconnect that are locked closed to ensure power and valve position indication is always available to the valve.

B. The MOV's have a breaker and disconnect that are locked open. Valve position indication is provided by an alternate DC power source.

C. The MOV's have a breaker and disconnect that are locked open but downstream of the control power transformer allowing continuous valve position indication.

D. The MOV's have a breaker and disconnect that are locked closed. Valve position indication is provided by an alternate DC power source.

93. The primary inventory trend system (PITS) provides reactor vessel level indication during accident conditions. Which condition ensures proper reference leg operation for PITS indication?

A. The RCP's are coasting down and the seal pot is continuously filling the reference leg.

B. The RCP's are off and CET density compensation of PITS is operating.

C. The RCP's are running and the RTD density compensation of PITS is operating.

D. The RCP's are off and the seal pot is continuously filling the reference leg.

94. You are the Refueling SRO in containment. The refueling crew has grappled a thrice burned assembly and starts to withdraw it from the core when several basketball-sized bubbles start to eminate from the vicinity of the grappled assembly. Which actions characterize your initial response as Refueling SRO?

A. Notify the control room, notify radiation controls, stabilize the assembly, have control room sound the containment evacuation alarm, evacuate personnel from containment.

B. Notify the control room, notify radiation controls, initiate the emergency plan (alert), have control room sound the containment evacuation alarm, evacuate personnel from containment.

C. Notify the control room, continue withdrawal to ascertain damage, stabilize the assembly, have control room sound the containment evacuation alarm, evacuate personnel from containment.

D. Notify the control room, stabilize the assembly, have control room sound the containment evacuation alarm, evacuate personnel from containment, have refueling crew ingest potassium iodide (KI).

95. The plant has experienced a total loss of AC power. ECA-0.0, "Total Loss of AC Power," has been initiated. Which method will be used to initiate safety injection?

A. Place the "BLOCK-AUTO-MANUAL" switch in "MANUAL" to provide auto start of safety injection pumps when power is restored.

B. Place all safety injection pumps in "PULL-TO-LOCK" to allow manual start of safety injection pumps when power is restored.

C. Place the "BLOCK-AUTO-MANUAL" switch in "BLOCK" to provide manual start of safety injection pumps when power is restored.

D. Place all safety injection pumps in "AUTO" to allow for automatic start of safety injection pumps when power is restored.

96. During a large break LOCA with RAS, the following conditions exist:

- HIS-M-50 & 51 are flashing green in the SIAS lightbox;
- LSI-M-40 & 41 are flashing green in the RAS lightbox;
- PCC-M-219 is solid green in the CIS lightbox;
- PW-A-78 is solid green in the SIAS/CIS lightbox;
- RWST level is less than 100,000 gallons;
- Containment pressure is 26 psia and decreasing.

The STA states that an ORANGE path exists for containment and recommends entry into FR-Z.2, "Containment Flooding." Based on the information available, which of the following would be the likely source of any extra water that has been dumped into the containment during this accident?

A. The RWST outlet isolation RAS bypass switch was left in "BYPASS".

B. The PCC system has ruptured and dumped its contents into the containment.

C. The containment sump level indication is high due to harsh containment environment.

D. The primary water header has ruptured inside the containment.

97. What would be an adverse consequence of failing to recirculate the RHR system prior to placing it in service?

A. The RHR heatup limit of 1260 °F/hr. will be exceeded when RH-M-1 and 2 are opened with RH-4 closed.

B. Excess positive reactivity may be added to the RCS even with the RCS borated to the cold shutdown condition.

C. The RHR spring reliefs (RH-S-24 and 25) may lift prematurely due to the delta T between the body and bonnet.

D. The RHR heat exchangers may develop RCS to component cooling system leaks caused by thermal shock to the RHR heat exchanger U-tubes.

98. Which of the following describes the sequence of events that occurs when main generator relay 86 BU actuates when connected to the grid?

A. Tripping of relay 86 BU sends a signal directly to all four (4) RPS channels to initiate a loss of load reactor trip.

B. Tripping of relay 86 BU sends a signal to 20 AST which energizes and initiates opening of the MG-set output breakers.

C. Tripping of relay 86 BU sends a signal to the auto stop oil pressure switches subsequently initiating a turbine, then reactor trip.

D. Tripping of relay 86 BU sends a signal to 20 ET which closes all four (4) stop valves subsequently initiating a reactor trip.

99. The reactor is in a cold shutdown condition (150 psia & 200 F) with RHR flow being maintained by LSI-F-59 at 2500 gpm. Electrical Maintenance has requested that Operations minimize plant electrical load by reducing flow to 1000 gpm. What adverse effect could this reduction in flow have on plant safety?

A. The RHR pump would start to overheat because this is the minimum flow at which an RHR pump should be operated.

B. The RHR pump would start to cavitate due to vortexing at the RHR pump suction valves (RH-M-1 & 2).

C. The RHR system would not provide adequate LTOP protection in the event of an inadvertant charging pump start.

D. The RHR system would not provide adequate LTOP protection when RH-M-1 & 2 shut on low RHR flow.

100. The plant is at 90% power with the governor valves full open. Tave is 555 F. If a turbine trip should occur:

A. The steam dump and turbine bypass system will not quick open because Tave is not at a high enough temperature.

B. The steam dump and turbine bypass system will quick open because Th is approximately 575 F.

C. The steam dump and turbine bypass system will quick open because Tave is greater than Tref.

D. The steam dump and turbine bypass system will not quick open because main steam pressure remains less than 765 psig.

SRO NRC Examination Answer Sheet Name:_____

1.	A	B	C	D
2.	A	B	C	D
3.	A	B	C	D
4.	A	B	C	D
5.	A	B	C	D
6.	A	B	C	D
7.	A	B	C	D
8.	A	B	C	D
9.	A	B	C	D
10.	A	B	C	D
11.	A	B	C	D
12.	A	B	C	D
13.	A	B	C	D
14.	A	B	C	D
15.	A	B	C	D
16.	A	B	C	D
17.	A	B	C	D
18.	A	B	C	D
19.	A	B	C	D
20.	A	B	C	D
21.	A	B	C	D
22.	A	B	C	D
23.	A	B	C	D
24.	A	B	C	D

SRO NRC Examination Answer Sheet Name:_____

25. A B C D

26. A B C D

27. A B C D

28. A B C D

29. A B C D

30. A B C D

31. A B C D

32. A B C D

33. A B C D

34. A B C D

35. A B C D

36. A B C D

37. A B C D

38. A B C D

39. A B C D

40. A B C D

41. A B C D

42. A B C D

43. A B C D

44. A B C D

45. A B C D

46. A B C D

47. A B C D

48. A B C D

SRO NRC Examination Answer Sheet Name:_____

49.	A	B	C	D
50.	A	B	C	D
51.	A	B	C	D
52.	A	B	C	D
53.	A	B	C	D
54.	A	B	C	D
55.	A	B	C	D
56.	A	B	C	D
57.	A	B	C	D
58.	A	B	C	D
59.	A	B	C	D
60.	A	B	C	D
61.	A	B	C	D
62.	A	B	C	D
63.	A	B	C	D
64.	A	B	C	D
65.	A	B	C	D
66.	A	B	C	D
67.	A	B	C	D
68.	A	B	C	D
69.	A	B	C	D
70.	A	B	C	D
71.	A	B	C	D
72.	A	B	C	D

SRO NRC Examination Answer Sheet Name:_____

73.	A	B	C	D
74.	A	B	C	D
75.	A	B	C	D
76.	A	B	C	D
77.	A	B	C	D
78.	A	B	C	D
79.	A	B	C	D
80.	A	B	C	D
81.	A	B	C	D
82.	A	B	C	D
83.	A	B	C	D
84.	A	B	C	D
85.	A	B	C	D
86.	A	B	C	D
87.	A	B	C	D
88.	A	B	C	D
89.	A	B	C	D
90.	A	B	C	D
91.	A	B	C	D
92.	A	B	C	D
93.	A	B	C	D
94.	A	B	C	D
95.	A	B	C	D
96.	A	B	C	D

SRO NRC Examination Answer Sheet Name:_____

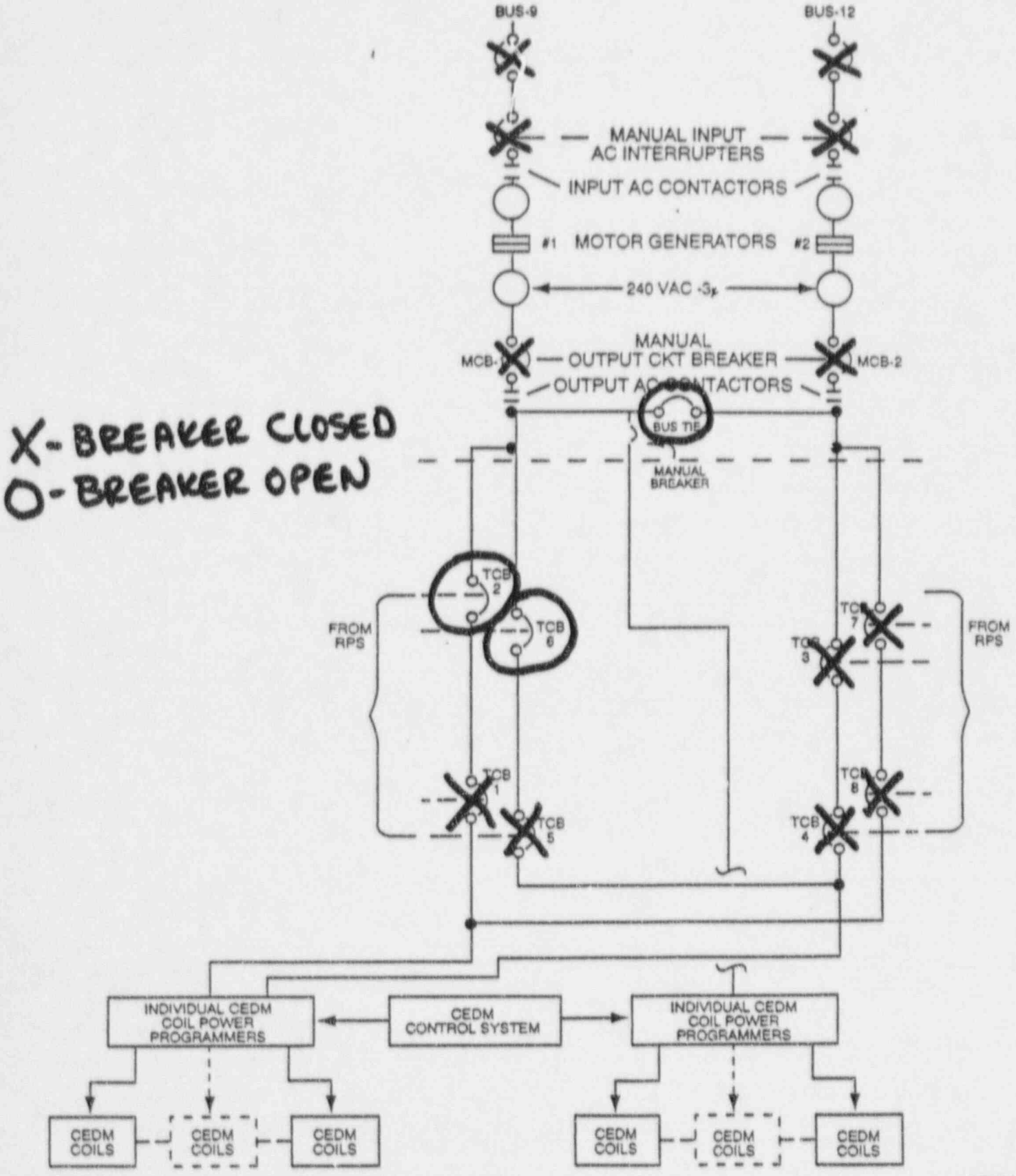
97. A B C D

98. A B C D

99. A B C D

100. A B C D

CEDM POWER SUPPLY



CEDM-1
3/26/96
RO-L-4.4
AO-L-4.1

PORC Mtg # [illegible] Date [illegible] FIGURE [illegible]

Reviewed by [signature] Date 6-12-95 Prepared by [signature]

STEAM GENERATOR LEVEL CORRECTION FOR WIDE RANGE CHANNELS

LI - 1214, 1224 & 1234

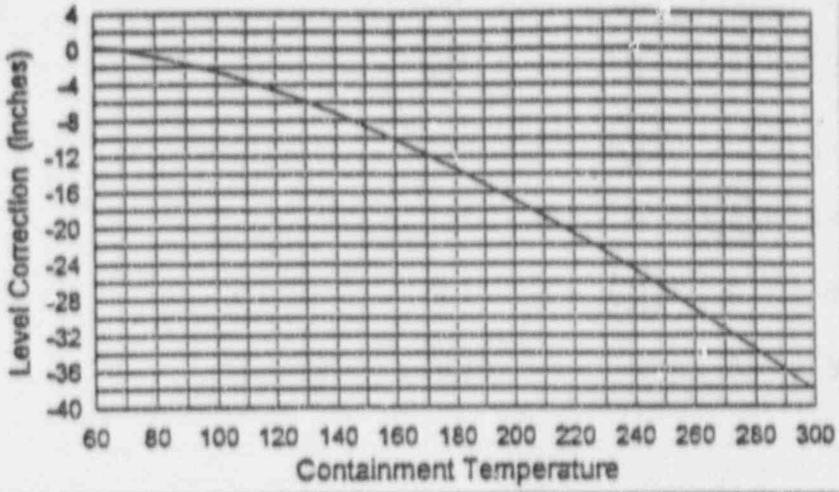
Example:

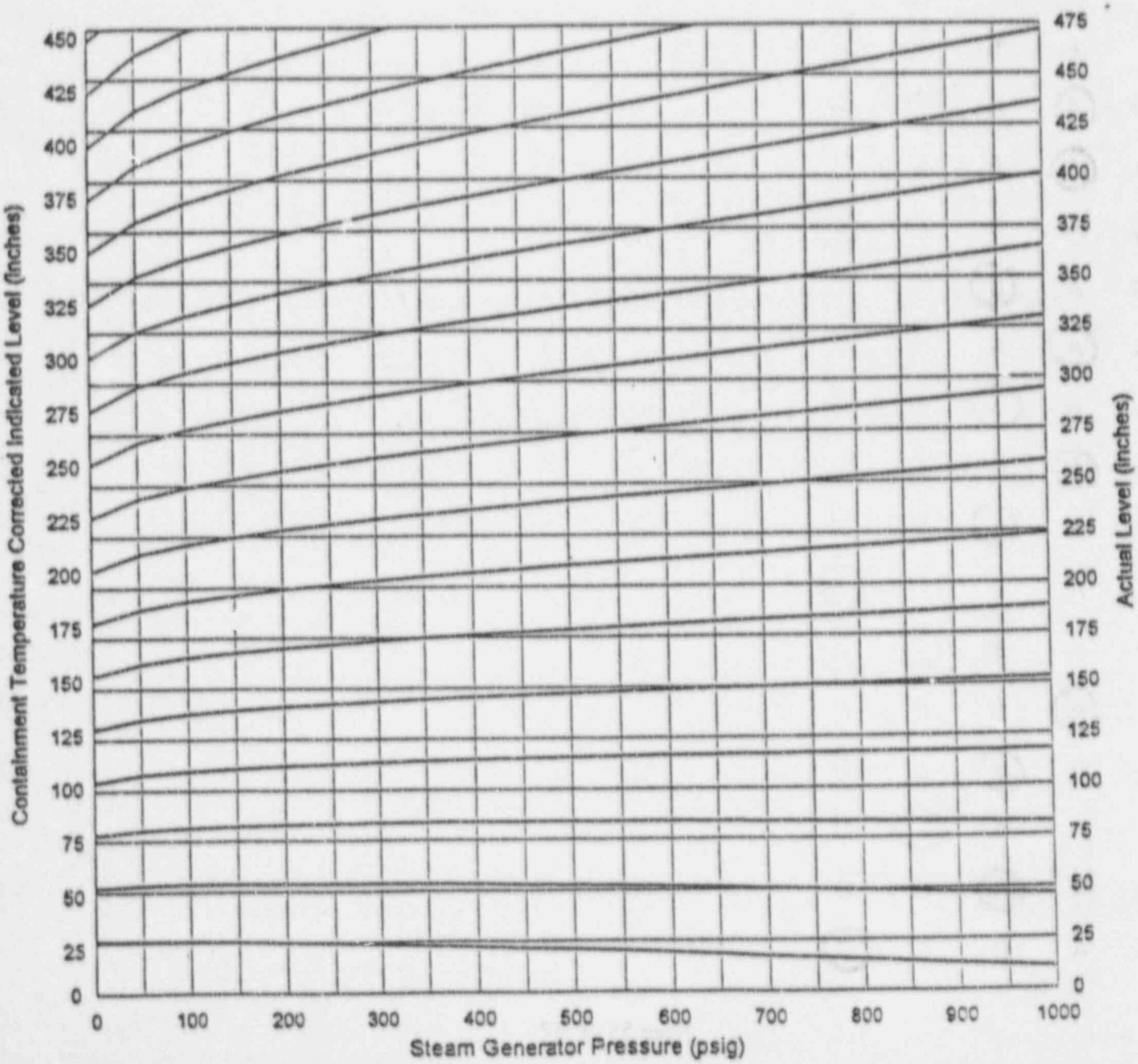
Indicated Level 331 inches
Containment Temperature 130F
Steam Generator Pressure 500 psig

Assume that the reference leg temperature equals containment temperature. From graph at right,
Indicated Level Correction -6 inches

Corrected Indicated Level 331 - 6 = 325 inches

Enter the graph along lines of corrected indicated level and steam generator pressure
Actual Level 400 inches





SRO NRC Examination Answer Sheet Name:_____

1.	A	B	C	(D)
2.	A	B	C	(D)
3.	A	(B)	C	D
4.	(A)	B	C	D
5.	A	(B)	C	D
6.	A	B	C	(D)
7.	A	B	(C)	D
8.	A	B	(C)	D
9.	A	B	C	(D)
10.	(A)	B	C	D
11.	(A)	B	C	D
12.	A	B	C	(D)
13.	A	(B)	C	D
14.	(A)	B	C	D
15.	A	(B)	C	D
16.	(A)	B	C	D
17.	A	(B)	C	D
18.	A	B	C	(D)
19.	A	B	(C)	D
20.	(A)	B	C	D
21.	A	(B)	C	D
22.	A	B	(C)	D
23.	A	(B)	C	D
24.	A	B	C	(D)

SRO NRC Examination Answer Sheet Name:_____

25.	A	B	(C)	D
26.	A	B	C	(D)
27.	A	(B)	C	D
28.	A	B	(C)	D
29.	(A)	B	C	D
30.	A	B	(C)	D
31.	A	(B)	C	D
32.	A	B	(C)	D
33.	A	(B)	C	D
34.	A	B	C	(D)
35.	(A)	B	C	D
36.	A	B	C	(D)
37.	A	(B)	C	D
38.	A	B	(C)	D
39.	(A)	B	C	D
40.	A	B	C	(D)
41.	(A)	B	C	D
42.	(A)	B	C	D
43.	A	(B)	C	D
44.	A	B	(C)	D
45.	A	(B)	C	D
46.	(A)	B	C	D
47.	A	B	(C)	D
48.	A	B	(C)	D

SRO NRC Examination Answer Sheet Name:_____

49.	A	B	**C**	D
50.	A	B	C	**D**
51.	A	**B**	C	D
52.	A	**B**	C	D
53.	**A**	B	C	D
54.	A	B	C	**D**
55.	A	B	**C**	D
56.	A	B	C	**D**
57.	**A**	B	C	D
58.	A	B	**C**	D
59.	A	B	**C**	D
60.	A	**B**	C	D
61.	A	B	C	**D**
62.	A	B	**C**	D
63.	**A**	B	C	D
64.	A	B	C	**D**
65.	A	**B**	C	D
66.	**A**	B	C	D
67.	A	B	C	**D**
68.	A	B	**C**	D
69.	A	**B**	C	D
70.	A	B	C	**D**
71.	**A**	B	C	D
72.	A	B	**C**	D

SRO NRC Examination Answer Sheet Name:_____

73.	A	B	(C)	D
74.	A	(B)	(C)	D
75.	A	(B)	C	D
76.	A	B	(C)	D
77.	A	B	C	(D)
78.	A	B	C	(D)
79.	A	(B)	C	D
80.	(A)	B	C	D
81.	A	B	C	(D)
82.	(A)	B	C	D
83.	(A)	B	C	D
84.	A	B	(C)	D
85.	(A)	B	C	D
86.	A	B	C	(D)
87.	A	B	(C)	D
88.	(A)	B	C	D
89.	A	B	(C)	D
90.	A	(B)	C	D
91.	A	B	C	(D)
92.	A	(B)	C	D
93.	A	B	C	(D)
94.	(A)	B	C	D
95.	A	(B)	C	D
96.	(A)	B	C	D

#74 BOTH B & C CORRECT. SEE JUSTIFICATION SHEET LZelli 6/12/97 Jim Kinsch

SRO NRC Examination Answer Sheet Name:_____

97. A (B) C D

98. A B C (D)

99. A B (C) D

100. (A) B C D

Attachment 2

MAINE YANKEE RO WRITTEN EXAM W/ANSWER KEY

COPY ANSWER KEY

U.S. NUCLEAR REGULATORY COMMISSION
MAINE YANKEE (CE)
REACTOR OPERATOR WRITTEN EXAMINATION

APPLICANT INFORMATION

NAME:_____ DATE:_____

INSTRUCTIONS

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Each question is worth one (1) point. The passing grade is 80%. Examination papers will be picked up four (4) hours after the examination starts.

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

_____
Applicant's Signature

RESULTS

Examination Value ..... 100 points

Applicant's Score ..... ___ points

Applicant's Grade ..... ___ points

_____
Graded by / Date

_____
Verified by / Date

Policies and Guidelines for taking NRC Written Examinations

1. Cheating on the examination will result in a denial of your application and could result in more severe penalties.

2. After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.

3. To pass the examination, you must achieve a grade of 80 percent or greater.

4. Each question is worth one (1) point.

5. There is a time limit of 4 hours for completing the examination.

6. Use only black ink or dark pencil to ensure legible copies.

7. Print your name in the blank provided on the examination cover sheet and the answer sheet.

8. Mark your answers on the answer sheet provided and do not leave any question blank.

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

10. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

11. When you complete the examination, assemble a package including the examination questions, examination aids, and answer sheets and give it to the examiner or proctor. Remember to sign the statement on the examination cover sheet.

12. After you have turned in your examination, leave the examination area as defined by the examiner.

1. During an accident, the following EOP's are entered (in order of entry):

   - Entered E-O, "RX Trip/Safety Injection" & EXITED at Step 10 due to loss of heat sink;
   - Entered FR-H.1, "Loss of Heat Sink", and referred to E-0 at Step 16 to complete immediate actions of E-O;
   - Continues in FR-H.1 and EXITED at Step 25 RNO for PORV's failing to close with heat sink re-established;
   - Entered E-1, "Loss of Primary or Secondary Coolant", and EXITED at Step 11 due to HPSI and spray pumps unable to supply adequate flow to RCS;
   - Entered ECA-1.1, "Loss of Cold Leg Recirculation", and EXITED at Step 32 to "Return to Procedure and Step in Affect."

   At this point the operator will:

   A. Return to E-O to complete any missed actions out to Step 25 when CSF Status trees are monitored.

   B. Return to FR-H.1 to complete any missed actions associated with restoration of the heat sink.

   C. Return to E-1 to complete actions required for loss of primary coolant.

   D. Return to ECA-1.1 Step 1 to ensure continuous flow of coolant is available to the core.

2. Which of the following describes the transthermal condition as defined in Technical Specifications?

   A. The reactor shutdown margin is 5% delta k/k and Tavg is between 200 °F and 500 °F.

   B. The reactor is subcritical by 5% delta k/k and Tavg is between 210 °F and 500 °F.

   C. The shutdown boron concentration is 5% delta k/k and Tavg is between 210 °F and 500 °F.

   D. The reactor is shutdown by 5% delta k/k and Tavg is between 200 °F and 500 °F.

3. The plant has just completed a chemistry hold at 20% power and is escalating power at 10%/hour to 55%. As plant temperature is changed, all four (4) power range channels receive an NI/delta T power alarm. What action is required by the operators?

   A. The power increase can continue until 55% power at which time an NI calibration and adjustment must be performed.

   B. The power increase should be terminated and the operator can manually adjust the NI potentiometer to clear the alarm.

   C. The power increase can continue as long as the NI/delta T power deviation does not go offscale on the RPSCIP panel.

   D. The power increase should be terminated and an NI calibration and adjustment should be performed to restore alarm operability.

4. Which one of the following is an adverse consequence of containment control air pressure being less than 70 psig when, in E-0, "Reactor Trip and Safety Injection"?

   A. The primary component cooling supply to the reactor coolant pumps will be lost.

   B. The containment air recirculation fans will not maintain containment pressure <70 psia on a LOCA.

   C. The pressurizer spray valves will fail open and result in loss of pressurizer pressure control.

   D. The seal water supply and return flow to the reactor coolant pumps will be lost.

5. Thermal mussel control operations are in progress on the south service water header. While performing this routine maintenance, the Operator must verify that the outboard heat exchanger (E-4A) delta P is not more than 2 psid higher than the inboard heat exchanger delta P (E-5A). What adverse consequence would result if this condition were allowed to occur?

   A. The "A" train of ECCS would be inoperable due to inadequate flow through the outboard heat exchanger.

   B. The "B" train of ECCS would be inoperable due to inadequate flow through the inboard heat exchanger.

   C. The "A" train of ECCS would be operable, but necessitate starting an additional service water pump.

   D. The "B" train of ECCS would be operable, but necessitate starting an additional service water pump.

6. A note in E3-0.2, "Natural Circulation Cooldown" states that "LTOP criteria cannot be met during natural circulation conditions without the HPSI flow restrictor in service." With a natural circulation cooldown occurring that is greater than 25 °F/hr., why is the dedicated operator stationed?

   A. Natural circulation cooldown is the least desirable method, therefore, additional plant monitoring is required.

   B. Natural circulation cooldown is difficult to control when cooling down greater than 25 °F/hr.

   C. Natural circulation cooldown could create an adverse thermal stress on the reactor vessel wall.

   D. Natural circulation cooldown will create voids that are not observable without PITS.

7. While monitoring Critical Safety Functions during a steam generator overfill/steam line break event, the operators have noted a greater than 100 °F/hr. cooldown rate. Pressurizer pressure and wide range T-cold are to the left of Limit A Curve, necessitating entry into a Functional Restoration Procedure. Which procedure would be entered and why?

A. Enter FR-P.1 due to concerns for thermal shock caused by rapid cooldown and to prevent flaw growth in the reactor vessel during repressurization.

B. Enter FR-P.1 due to concerns for thermal shock caused by rapid cooldown and to arrest compressive stresses on the inner wall during repressurization.

C. Enter FR-I.1 due to concerns for brittle failure caused by rapid cooldown and to prevent flaw growth in the reactor vessel during repressurization.

D. Enter FR-I.1 due to concerns for crystalline structure shift from face center to body center cubic which could lead to ductile failure.

8. While performing operability surveillance for DG-2, with DG-2 paralleled to MCC-9B1, the operator records the following information:

- DG-2 amperage at 200 amps;
- DG-2 voltage at 490 volts.

In an effort to verify that DG-2 is in the minimum amperage condition, the voltage level knob is turned in the raise (clockwise) direction and DG-2 amps increase. Why is the meter responding in this manner?

A. DG-2 is overexcited and is supplying lagging VARS out to MCC-9B1.

B. DG-2 is overexcited and is absorbing leading VARS in from MCC-9B1.

C. DG-2 is underexcited and is supplying lagging VARS out to MCC-9B1.

D. DG-2 is underexcited and is absorbing leading VARS in from MCC-9B1.

9. The reactor is operating at 100% power when a main feed regulating valve (FW-F-207) fails open. What is the most likely sequence of events if P-2C is in operation and no operator action is taken?

   A. Feed water header pressure decreases, standby MFW pump auto starts, P-2C speed increases, feed water header pressure increases, P-2C suction pressure increases.

   B. Feed water header pressure decreases, P-2C speed decreases, standby MFW pump auto starts, feed water header pressure increases, P-2C suction pressure increases.

   C. Feed water header pressure decreases, P-2C speed decreases, P-2C suction pressure decreases, standby condensate pump auto starts, P-2C speed increases.

   D. Feed water header pressure decreases, P-2C speed increases, standby MFW pump auto starts, P-2C suction pressure decreases, standby condensate pump auto starts.

10. Following a refueling outage, the plant is returning to power and is at a 5% hold for S/G chemistry. Pressurizer pressure starts to decrease and then the primary RO reports that the "A" train SIAS pumps have automatically started. What action should be taken?

   A. Enter AOP 2-10 to evaluate RCS leakage.

   B. Enter E-0 in order to fire both trains of safety injection.

   C. Enter AOP 2-25 to evaluate plant radiation levels.

   D. Enter ES-1.1 to terminate safety injection.

11. During refueling operations you are the operator in the Control Room. The last three readings of 1/M are 1.1, .95, and .82. What actions are taken during refueling operations when 1/M values are decreasing?

    A. Suspend refueling operations; verify decreasing audible countrate; ensure no dilution flow paths exist; verify RCS boron > refueling boron concentratation.

    B. Continue refueling operations; verify increasing audible countrate; verify boration flow path available; notify plant personnel involved in any primary system realignments.

    C. Suspend refueling operations; verify increasing audible countrate; verify boration flow path availability; prepare to commence emergency boration; verify RCS boron concentration.

    D. Continue refueling operations; decrease multiplier on audible countrate instrument; notify personnel in containment; commence emergency boration.

12. Which statement describes the switch position required for automatic operation of the PORV's when RCS temperature is below the minimum pressurization temperature?

    A. HPSR/VPSR switch in "HPSR" with PORV switch in "AUTO" and PORV block valve open.

    B. HPSR/VPSR switch in "VPSR" with PORV switch in "CLOSED" and PORV block valve open.

    C. HPSR/VPSR switch in "HPSR" with PORV switch in "AUTO" and PORV block valve closed.

    D. HPSR/VPSR switch in "VPSR" with PORV switch in "AUTO" and PORV block valve open.

13. A steam generator tube rupture is in progress. The steam generator subcooled margin monitor reads 38 °F. What must be done to equalize steam generator and RCS pressures?

A. Open the turbine bypass valves to reduce steam generator pressure.

B. Open the pressurizer spray valves to reduce RCS pressure.

C. Isolate the steam generators to increase steam generator pressure.

D. Energize the pressurizer heaters to increase RCS pressure.

14. In preparation for restoring AC power following a total loss of AC, ECA-0.0, "Loss of All AC Power," requires the operator to place most MCB operated plant equipment in PULL-TO-LOCK except for the PCC and SCC pumps, where one of each is left in AUTO. Why are the PCC and SCC pumps left in AUTO?

A. To supply immediate cooling water to the RCP seal in order to minimize seal damage.

B. To provide immediate loading on the EDG in order to prevent overspeed.

C. To supply immediate cooling for the RHR heat exchangers to continue plant cooldown.

D. To allow for immediate cooling of the EDG to prevent overheating.

15. The "A" traveling water screen has failed due to high differential pressure. The "A" condenser waterbox has been removed from service to clean debris off the inlet tube sheet. An operator verifying valve alignment inadvertantly shuts the "B" waterbox outlet to the vacuum priming tank causing condenser differential pressure to rise. What actions should be taken to prevent turbine damage?

    A. Continue to monitor condenser differential pressure and manually trip the turbine when this value is greater than 3.5" Hg.

    B. Place the EJ-2A and B condenser hoggers in service to minimize the main condenser differential pressure.

    C. Monitor directional thrust on the main turbine shaft and manually trip the turbine if thrust is excessive.

    D. Monitor turbine supervisory instrumentation until turbine vibrations exceed the 18 mil setpoint for safe operations, then trip the turbine.

16. During normal at-power operations, the letdown monitor (RI-3102) counts are trending upward. Chemistry has notified Operations that primary system samples indicate several fuel rods may have failed. Your actions to determine the extent of fuel damage and minimize radiation levels are based on:

    A. Excessive fission products in the reactor coolant system which may inhibit the heat transfer surfaces in both the S/G and reactor core.

    B. Protection of the health and safety of the public per 10 CFR 100 in the event of a steam generator tube rupture.

    C. Protective action guidelines per the Emergency Plan that are required to be pre-scripted during a fuel failure scenario in the event of evacuation.

    D. Known limitations with the current radiation monitoring circuitry to effectively chart increases in RCS activity.

17. While in FR-C.1, "Inadequate Core Cooling," the Operator notes LPSI flow oscillations when running a containment spray pump and a LPSI pump from the same safeguards sump. Assuming adequate water level in containment and the desire to run the LPSI pump during RAS to avoid inadequate core cooling, what action in the Control Room would mitigate LPSI pump cavitation in this condition?

A. Reset the RAS signal and throttle LSI-M-11, 21, and 31 (LPSI loop stops).

B. Reset the SIAS signal and throttle LSI-F-59 (RHR flow control).

C. Reset the RAS signal and throttle LSI-F-59 (RHR flow control).

D. Reset the SIAS signal and throttle LSI-M-11, 21, and 31 (LPSI loop stops).

18. The main turbine has numerous protective devices assuring plant and equipment safety including less direct methods of tripping the turbine. Which of the following methods will generate a remote turbine trip signal?

A. With T1H, KG-1, and KG1-375 open, the turbine will trip on a one minute time delay (anti-motoring).

B. With two-out-of-four (2/4) intercept valves closed and two-out-of-four (2/4) reheat valves closed, the turbine will trip.

C. With a low #2 S/G water level on channels A & B level indications (2/2 taken twice), the turbine will trip.

D. Closure of all three (3) EFCV's, automatically or manually via operator action, will trip the turbine on low steam pressure.

19. During a fire, the PSS mans the alternate shutdown panel (ASP) and proceeds to gain control of equipment necessary to minimize loss of RCS inventory. Which components must be controlled to stop RCS leakage?

A. Drain header isolation valve (DR-M-3) to "CLOSE"; EFCV's (MS-11, 22, and 33) to "CLOSE"; letdown temperature control valve (LD-T-5) to "CLOSE."

B. Drain header control valve (DR-A-6) to "CLOSE"; letdown temperature control valve (LD-A-68) to "CLOSE"; RCP seal water return valves (SL-M- 29, 40 and 51) to "CLOSE."

C. Drain header isolation valve (DR-M-3) to "CLOSE"; letdown temperature control valve (LD-A-68) to "CLOSE"; RCP seal water return valves (SL-M- 29, 40 and 51) to "CLOSE."

D. Drain header control valve (DR-A-6) to "CLOSE"; letdown temperature control valve (LD-T-5) to "CLOSE"; RCP seal water return valves (SL-M-29, 40, and 51) to "CLOSE."

20. The plant is in a cooldown using AOP 2-90-8, "Plant Cooldown From Alternate Shutdown Panel." Several times in this procedure the operator is cautioned that the RCS cold shutdown boron concentration is not reached unless pressurizer level is increased to 80% at some point during the cooldown. Why must the pressurizer be filled to this level?

A. Pressurizer level instrument (LI-106) on the ASP is hot calibrated, 80% PZR level ensures that the PZR will have a bubble during the cooldown.

B. This guarantees adequate shutdown margin is achieved for the cold shutdown condition by ensuring sufficient RWST water is injected into the RCS.

C. This ensures the cold shutdown boron concentration listed in the TDB, even with rods fully withdrawn, is achieved.

D. This ensures adequate RCS volume in the event that normal power cannot be restored and a seal water return MOV does not close.

21. With 120 VAC vital buses 1 and 4 cross-connected and powered from inverter 1 (the spare inverter is out of service) inverter 1 fails causing a loss of both buses. The reactor operator places the "B" train PORV (PR-S-15) in the "CLOSED" position. The valve indicates closed, but the acoustic accelerometer is still in alarm. What method is used to isolate the PORV?

    A. Take the "B" train PORV block valve (PR-M-17) to "CLOSE" and return the PORV (PR-S-15) switch to "OFF."

    B. Take the "B" train "HPSR/VPSR" switch to "VPSR" and raise the setpoint to 2400 psig to close the PORV.

    C. Take the "B" train PORV block valve (PR-M-17) to "CLOSE" and then open the PR-M-17 breaker on MCC-8B.

    D. Take the "B" train "HPSR/VPSR" switch to "HPSR" and raise the setpoint to 2400 psig to close the PORV.

22. The plant is at 55% power during CEA testing. A voltage spike affecting both timer module power supplies causes a Group 5A rod to drop. How long does the operator have, per Technical Specifications, to correct the rod misalignment?

    A. The operator must immediately correct the rod misalignment.

    B. The operator has 15 minutes to correct the rod misalignment

    C. The operator has 30 minutes to correct the rod misalignment.

    D. The operator has 1 hour to correct the rod misalignment.

23. A fire in the protected cable tray room (AOP 2-90-1) has spread into the control room ceiling and an evacuation of the control room is imminent. A station blackout must be created by the operator:

    A. In order to prevent spurious PORV operation when de-energizing MCC-7A and 8A.

    B. In order to prevent overloaded diesels because 3T5 and 4T6 will fail closed.

    C. Due to the inability to control systems that may be operating.

    D. Due to the inability to cool key plant components, such as RCP's.

24. A main steamline elbow upstream of the #2 non-return valve breaks while at 100% power and results in entry into E-O, "Reactor Trip or Safety Injection." An operator finds all three blowdown valves (BD-T-12, 22 and 32) still open when verifying ECCS valve alignment. Further analysis indicates that the HELB blowdown valves (BD-T-141 thru 146) are also open. Why is this condition a concern for this accident situation?

A. BD-T-141 thru 146 should have closed on low S/G level to prevent an excessive cooldown and possible return to criticality.

B. BD-T-12, 22, and 32 should have closed on the SIAS/CIS signal to preserve feedwater for decay heat removal.

C. BD-T-12, 22, and 32 should have closed on low S/G level to prevent an excessive cooldown and possible return to criticality.

D. BD-T-141 thru 146 should have closed on the SIAS/CIS signal to preserve feedwater for decay heat removal.

25. The plant is at HFP. During inspections it is discovered that the reactor trip breaker manual pushbutton wiring is not in compliance with the IEEE standard. What action is required?

A. Place the reactor in hot standby within six (6) hours and in hot shutdown in the following thirty (30) hours.

B. Attempt to repair in the next seventy-two (72) hours (as allowed by the remedial action statement).

C. Commence a reactor shutdown within one (1) hour and place the plant in hot shutdown within six (6) hours.

D. Immediately trip the reactor via the ATWS/DSS pushbuttons and be in cold shutdown within six (6) hours.

26. During verification of natural circulation conditions, the primary side RO reports that core region subcooled margin monitor is not available for operator use. Which of the following would provide the best indication of natural circulation flow?

A. S/G pressure, Pressurizer level, Thot, and CET's.

B. S/G pressure, Pressurizer pressure, Tcold, and CET's.

C. RCS pressure, Pressurizer level, Thot, and CET's.

D. RCS pressure, S/G level, Tcold, and CET's.

27. An emergency boration of the RCS is required following entry into FR-S.1, "Nuclear Power Generation/ATWS." Which of the following flowpath actions will meet FR-S.1 criteria for emergency boration?

A. Verify a charging pump operating, open HSI-M-50 and 51, take LD-A-51 to "PDT", start two boric acid transfer pumps.

B. Start two boric acid transfer pumps, maximize charging flow, verify a charging pump operating, close CH-M-1.

C. Start two boric acid transfer pumps, increase auxiliary charging pump (P-7) flow to at least 15 gpm, close CH-M-87, open BA-M-36 and 37.

D. Verify a charging pump operating with CH-F-38 open, start two boric acid transfer pumps, open BA-M-36 and 37, close CH-M-87.

28. The plant has experienced a LOCA with failed fuel. The containment spray system is operating in the recirculation mode. RHR heat exchanger tube leaks have spread contamination throughout the PCC and SCC systems. Chemistry wants to increase the recirculation flow rate through the PCC and SCC chemical addition tanks to > 20 gpm (bypassing the heat exchangers) to facilitate degassification. Why is this situation undesirable?

A. It could lead to an unmonitored release via the off-gas filters and primary vent stack.

B. Increased degassification with residual system chromates can form chromic acid which will accelerate piping corrosion.

C. Inadequate PCC/SCC flow through the PCC and SCC heat exchangers could violate conditions in the accident analysis.

D. The PCC/SCC surge tanks become a point source for radiation in an uncontained and unshielded area of the plant.

29. Which of the following would indicate that the pressurizer is in a saturated condition?

A. On a reactor coolant system outsurge, RCS pressure decreases slowly as the steam/water interface flashes.

B. On a reactor coolant system outsurge, RCS pressure decreases to the TM/LP trip setpoint.

C. On a reactor coolant system insurge, RCS pressure increases rapidly as the bubble compresses.

D. On a reactor coolant system insurge, RCS pressure increases until the PORV setpoint is reached.

30. While maintaining a hot shutdown condition, the #1 RCP seal water return flow high alarm is received and the operator has indications that all three seals are failed. The operator notes that the #1 RCP seal water return indication on the MCB is pegged high and the other two RCP's seal water return flows are <1 gpm. How does this condition effect the operation of the #1 RCP?

    A. The #1 RCP may remain operating but the seal water return valve (SL-M-29) should be closed.

    B. As long as seal water injection flow is greater than seal water return flow, the #1 RCP may continue running.

    C. The #1 RCP must be immediately secured and the seal water supply valve (SL-F-22) closed.

    D. The #1 RCP should be tripped and the seal water return valve (SL-M-29) closed.

31. The reactor has tripped from a total loss of offsite power and the emergency diesels (DG-1A and 1B) are operating and supplying their respective emergency buses. Breakers 1R, 2R, 3R, and 4R are "green flagged open" and breakers 1U, 2U, 3U, and 4U are "red flagged open". Undervoltage lockout relays 27Y-5 and 27Y-6 cannot be reset. What action is necessary to reset these relays?

    A. Breakers 3R and 4R must be placed in "PULL-TO-LOCK" before the 27Y-5 and 27Y-6 relays will reset.

    B. Breakers 3U and 4U must be placed in "PULL-TO-LOCK" before the 27Y-5 and 27Y-6 relays will reset.

    C. Breakers 1R and 2R must be placed in "PULL-TO-LOCK" before the 27Y-5 and 27Y-6 relays will reset.

    D. Breakers 1U and 2U must be placed in "PULL-TO-LOCK" before the 27Y-5 and 27Y-6 relays will reset.

32. Following a steam line break accident the SI termination procedure (ES-1.1) calls for throttling of HPSI flow before resetting SIAS. How is HPSI flow throttled in this condition?

A. HSI-M-41 and 42 NORMAL/BYPASS keys to BYPASS; HSI-M-11, 12, 21, 22, 31, and 32 throttled as necessary.

B. HSI-M-41 and 42 NORMAL/BYPASS keys to NORMAL; HSI-M-41 and 42 throttled as necessary.

C. HSI-M-41 and 42 NORMAL/BYPASS keys to BYPASS; HSI-M-41 and 42 throttled as necessary.

D. HSI-M-41 and 42 NORMAL/BYPASS keys to NORMAL; HSI-M-11, 12, 21, 22, 31, and 32 throttled as necessary.

33. The plant has experienced a small break LOCA during a station blackout and P-25B, the turbine driven AFW pump, is unable to provide feed flow. Core temperatures are rising along with pressurizer pressure with an average CET temperature of 750 °F and pressurizer pressure of 1800 psia. The core region subcooled margin monitors will:

A. Continuously flash a -129 °F indication on MCB Section "B."

B. Continuously flash a +129 °F indication on MCB Section "B."

C. Continuously flash a -75 °F indication on MCB Section "B."

D. Continuously flash a -50 °F indication on MCB Section "B."

34. The plant is critical at 10-1% power with the following RPS conditions :

- The start-up rate trip for channel D is in bypass via the Trip Inhibit Bypass key;
- The channel D amber indication light is lit (HI SUR level) .

In this configuration, which combination of logic matrixes will generate a start-up rate (SUR) reactor trip?

A. The AB, AC, and BC logic matrixes.

B. The AB, AC, and AD logic matrixes.

C. The BC, BD, and CD logic matrixes.

D. The AA, BB, and CC logic matrixes.

35. The plant is operating at 80% power when an RPS calibration is performed based on the "steam flow" calorimetric. As power is returned to 100%, steam flow power indication is less than delta T power indication. Why does this occur?

A. The hotter water when greater than 80% power has increased neutron leakage and the RPS NI detectors now see more neutrons.

B. The steam flow calorimetric introduces an overly conservative value for power level when at 80%.

C. The auxiliary steam loads at 80% power were not accounted for in the steam flow calorimetric.

D. The delta T power instrument was not recalibrated for the higher Tcold value at 100% power.

36. While at 100% power with P-2C in service, the P-2C recirculation valve fails wide open. How does the condensate system respond?

A. The standby condensate pump auto starts on low feed pump discharge pressure.

B. The standby condensate pump recirculation valve closes.

C. The condensate gland exhaust condenser bypass valve opens.

D. The standby condensate pump auto starts on low feed pump suction pressure.

37. The wide range logarithmic channels each have three (3) fission chambers per detector. The source range nuclear instruments utilize all three (3) fission chambers while the wide range nuclear instruments use only one (1) fission chamber. If the fission chamber that feeds the wide range instrument fails low on a power increase, that channel's output would:

A. Lower the CPS output in the source range and slightly lower the value at which the Level 1 (2%) and Level 2 (10-4%) bistables are actuated.

B. Not affect the CPS output in the source range, but will prevent the Level 1 and 2 bistables from actuating at 2% and 10-4% respectively.

C. Lower the CPS output in the source range and will prevent the Level 1 and 2 bistables from actuating at 2% and 10-4% respectively.

D. Not affect the CPS output in the source range and slightly lower the value at which the Level 1 (2%) and Level 2 (10-4%) bistables are actuated.

38. The computer room air conditioners are unable to maintain computer room temperature and a manual shutdown of the plant computer is required. In an effort to verify Technical Specification 3.9, how can the operator read CET temperatures?

A. Access the Computer Room, use a calibrated thermometer, disconnect leads at reference junction, read CET temperatures.

B. Access the Reactor MCC Room, use a calibrated thermometer, disconnect leads at measuring junction, read CET temperatures.

C. Access the Remote Instrumentation Room, use a calibrated thermometer, disconnect leads at measuring junction, read CET temperatures.

D. Access Reactor MCC Room, use a calibrated thermometer, disconnect leads at reference junction, read CET temperatures.

39. The plant is at 50% power when a Train "A" HELB signal is actuated in the PAB. Which of the following calculations/systems would be directly or indirectly affected by Train "A" HELB actuation?

A. MWth, HV-7 heating steam, and VCT level.

B. MWth, seal water temperature, and PAB general area ventilation (FN-2).

C. S/G radiation monitors, MWth, and BWST heating.

D. Letdown radiation monitor, MWth, and Spray Building pressure.

40. Which of the following indications could be used to differentiate between an actual low pressurizer level and a low failure of the "in-service" pressurizer level control channel?

A. All heaters are de-energized.

B. Standby charging pump in "AUTO" starts.

C. Minimum letdown flow is indicated on the letdown flow controller.

D. Maximum charging flow is indicated on the charging flow controller.

41. The automatic mode of primary water and boric acid makeup to the VCT is unavailable due to a problem with the VCT level sigma indication. If the operator chooses to add boric acid with the makeup mode selector switch in the "MANUAL" position, what actions occur to add makeup to the VCT?

A. The boric acid transfer pump (P-6 A, B, C) is started automatically and the makeup supply valve to the VCT (BA-A-32) will be manually opened.

B. The boric acid transfer pump (P-6 A, B, C) is started manually and the makeup supply valve to the VCT (BA-A-32) will be automatically opened.

C. The boric acid transfer pump (P-6 A, B, C) is started automatically and the makeup supply valve to the VCT (BA-A-32) will be automatically opened.

D. The boric acid transfer pump (P-6 A, B, C) is started manually and the makeup supply valve to the VCT (BA-A-32) will be manually opened.

42. While at 100% power, high vibration alarms are received on #3 RCP. While investigating the alarm locations on the RCP vibration monitor, the reactor trips on low flow.

- The green and amber lights on #3 RCP control switch are lit;
- The 86 device (86 P-1-3) on the breaker cubicle is "tripped";
- Overcurrent devices on two phases (51-A and 51-C) on #3 RCP are tripped.

What is the probable cause and effect of this event?

A. An RCP seized rotor and challenge to the fuel centerline melt safety limit.

B. An RCP sheared impeller and challenge to the DNBR safety limit.

C. An RCP seized rotor and challenge to the DNBR safety limit.

D. An RCP sheared impeller and challenge to the fuel centerline melt safety limit.

43. During CEA exercising (Surveillance Proc. 3-1-8) a group 5 CEA drops into the core while at 80% power. The operators employ the "long term-slow recovery" method to restore the dropped rod per AOP 2-21, "Misaligned (dropped) CEA", because of problems with that rod's power supply. Why is power reduced in this situation?

A. Power reductions prior to rod recovery control xenon oscillations and symmetric offset limits.

B. Power reductions prior to rod recovery minimize flux peaking and limit pellet clad interactions.

C. Power reductions prior to rod recovery increase the allowed KW/FT value and decrease the allowed FRT limit.

D. Power reductions prior to rod recovery eliminate the need for additional boration.

44. Reactor Engineering information for symmetric offset control includes guidance on movement of CEA's when controlling symmetric offset (TDB Figure 1.1.4). If the steady state value of symmetric offset is less than zero (negative value) why are rods pulled outward?

A. To allow for stabilization of KW/FT values.

B. To minimize xenon oscillations.

C. To balance the radial flux profile.

D. To increase upper core power production.

45. The S/G wide range channel is being used to control S/G level during a plant cooldown. With containment temperature at 90 °F, S/G pressure at 300 psig, and indicated wide range level at 300", what is the actual level in the S/G? (Use the attached figure)

A. 260"

B. 312"

C. 350"

D. 400"

46. The plant has tripped on a low steam generator pressure signal followed by EFCV closure due to a catastrophic failure of the main steam header in the turbine hall. In order to open the #2 S/G main feed regulating valve, the operator must:

A. Bypass both trains of feed water isolation and reset the turbine trip signal.

B. Bypass one train of feed water isolation or reset the turbine trip signal.

C. Bypass both trains of feed water isolation and press the "Steam Dump Override" push button.

D. Bypass one train of feed water isolation and reset the turbine trip signal.

47. Which of the following conditions will result in a boration of the RCS?

A. Placing the makeup mode selector switch in "BORATE" with the boric acid flow control valve (BA-F-30) set at 0 gpm and CH-F-38 in "AUTO."

B. Placing an emergency boration valve switch (BA-M-37) in "OPEN" with VCT pressure at 20 psig while on normal letdown with CH-F-38 in "AUTO."

C. Placing an emergency boration valve switch (BA-M-37) in "OPEN" while on alternate letdown with CH-M-87 shut and CH-F-38 in "AUTO."

D. Placing the boric acid flow control valve (BA-F-30) at 15 gpm with the makeup mode selector switch in "DILUTE" and CH-F-38 in "AUTO."

48. Prior to operating the boron recovery system (EV-1) to process hydrogenated waste from the PDT, the degasifiers are run to remove hydrogen and other radioactive gases. How is oxygen instrusion into the waste gas system prevented when the degasifier system has cooled down and is in standby?

A. The degasifier on-line vents remain open to allow the waste gas surge tank to float on the degasifiers.

B. The degasifier vent cooler bypasses open to allow the waste gas surge tank to float on the degasifiers.

C. The degasifier vent cooler bypasses open to allow the in-service waste gas decay drum to float on the degasifiers.

D. The degasifier on-line vents remain open to allow the in-service waste gas decay drum to float on the degasifiers.

49. During a design basis accident, the containment is cooled by the containment spray system. The normal cooling water supply for containment recirculation fans (PCC-A-238) can be isolated either:

A. Automatically on a Train "A" CIS or manually from the Train "A" ESF panel.

B. Automatically on a Train "A" CSAS or manually from the Train "A" ESF panel.

C. Manually on a Train "A" CIS (at the MCB) or automatically from the Train "A" ESF panel.

D. Manually on a Train "A" CSAS (at the MCB) or automatically from the Train "A" ESF panel.

50. The following conditions exist:

- PAB ventilation exhaust fan (FN-2) has tripped;
- Containment gas monitor (RM-6102Y) is in alarm;
- Primary vent stack gas monitor (RM-3902Y) is in alarm;
- Containment ventilation supply fan (HV-9) has tripped;
- VP-A-1, 2, 3, 4, & 5 have tripped closed.

Which scenario would be responsible for these conditions and alarms?

A. A containment "refueling" purge was in progress.

B. A containment "on-line" purge was in progress.

C. The waste gas surge tank has ruptured in the PAB upper level.

D. The loop seal between the waste gas surge tank and the primary vent stack was lost.

51. The plant is in a mini-outage to conduct fuel sipping operations in the spent fuel pool (SFP). While moving an assembly in the SFP a spent fuel pool area monitor radiation alarm is received. What action occurs as a result of this alarm?

A. The upender cannot be raised in the SFP.

B. The new fuel elevator upward motion is inhibited.

C. The SFP ventilation system is automatically shut down.

D. The SFP crane trolley movement is inhibited.

52. The plant has experienced a total loss of off-site power and the plant is tripped. The control room was evacuated due to noxious fumes eminating from the electrical board. An operator in the EFW pump room is preparing to start P-25A following an overspeed trip of P-25B. What conditions are required to start P-25A?

A. ASP normal/alternate switch in "ALTERNATE", DG-1A running with its output breaker shut, P-25A ASP control switch to "CLOSE."

B. ASP normal/alternate switch in "NORMAL", DG-1B running with its output breaker shut, P-25A ASP control switch to "CLOSE."

C. ASP normal/alternate switch in "ALTERNATE", DG-1B running with its output breaker shut, P-25A ASP control switch to "CLOSE."

D. ASP normal/alternate switch in "NORMAL", DG-1A running with its output breaker shut, P-25A ASP control switch to "CLOSE."

53. Procedure FR-S.1, "Nuclear Power Generation/ATWS," was entered from E-O, "Reactor Trip or Safety Injection" when it was determined that the reactor was not shutdown. A caution in FR-S.1 states, "If all S/G's are faulted, maintain total EFW flow at least 60 gpm per running EFW pump AND balance flow to each S/G." What is the reason for both of these requirements?

A. Maintaining 60 gpm flow ensures adequate cooling flow through the pump while the balanced flow ensures the S/G's remain 'wetted' which minimizes thermal shock to the tubes and tube sheet.

B. Maintaining 60 gpm flow provides minimum indication of pump operability while the balanced flow ensures the S/G's tube bundle area will not dry out causing sludge densification and possible tube failure.

C. Maintaining 60 gpm flow ensures adequate cooling flow through the pump while the balanced flow ensures the S/G's tube bundle area will not dry out causing sludge densification and possible tube failure.

D. Maintaining 60 gpm flow provides minimum indication of pump operability while the balanced flow ensures the S/G's remain 'wetted' which minimizes thermal shock to the tubes and tube sheet.

54. During alignment for a liquid waste release, contractors moving equipment through the PAB inadvertantly bump and raise the setting for the flow controller (FC-3802) which was set for automatic operation at 50% open. Approximately fifteen (15) minutes into the release, the auxiliary operator reports a high differential pressure (40 psid) across the test tank release filter (FL-66) and the filter is bypassed. Which group of statements represents indications you would expect to see on the liquid waste disposal system monitor (RM-3801)?

A. The initial radiation level on RM-3801 is lower than expected when the release begins and lower than expected after the filter is bypassed.

B. The initial radiation level on RM-3801 is higher than expected when the release begins and higher than expected after the filter is bypassed.

C. The initial radiation level on RM-3801 is higher than expected when the release begins and lower than expected after the filter is bypassed.

D. The initial radiation level on RM-3801 is lower than expected when the release begins and higher than expected after the filter is bypassed.

55. During maintenance of battery bus #3 (disconnected from the bus), a loss of DC bus #3 occurs (the vital AC bus is still available). The plant does not trip. The RO reports that one PORV (PR-S-15) and its associated block valve (PR-M-17) are energized and one (1) set of proportional heaters (E-2PB) are deenergized. Do you concur with the analysis of this situation? Why?

A. Yes, because you verify that the indicating lights for E-2PB are off and the lights for PR-S-15 and PR-M 17 are on.

B. No, because if E-2PB has lost its indication, then PR-S-15 and PR-M-17 should also have lost their indications.

C. Yes, because PR-S-15 and PR-M-17 retain DC control power on a loss of DC bus #3.

D. No, because the proportional heaters have lost indication only. The E-2PB breaker is still closed.

56. The plant has tripped on a main steam header rupture in the turbine hall. The EFCV's have closed and steam generator pressures are hovering around 400 psig. What must be done to open the EFW butterfly valves?

A. Place the excess flow check valves in the "CLOSED" position.

B. Place the EFW-A-338, 339, and 340 "NORMAL/ALTERNATE" T-switch in the EFW pump room to "ALTERNATE."

C. Verify adequate instrument air pressure in the receivers in the EFW pump room so that the valves will open.

D. Manually open the EFW butterfly valves (EFW-A-338, 339, and 340) from the EFW pump room.

57. The reactor is being started up following an extended refueling outage. The fission chambers swap from CPS to % PWR at 1000 cps and 10-6% power respectively. If the reactor must be shut down after critical rod data is obtained, what relationship exists between CPS and % PWR indication as the reactor enters the source range?

A. Counts per second (cps) and % power have no relationship because of the number of detectors used by the source and wide range instruments.

B. Counts per second (cps) and % power are inversely related, that is 10-6% power equals 1000 cps; 10-7% power equals 10 cps, etc.

C. Counts per second (cps) and % power are directly related, that is, 10-6% power equals 1000 cps; 10-7% power equals 100 cps, etc.

D. Counts per second (cps) and % power are inversely related, that is, 10-6% power equals 1000 cps; 10-7% power equals 100 cps, etc.

58. The reactor is cooling down with the "A" RHR pump and the "A" RHR heat exchanger in service. The "B" RHR pump and the "B" RHR heat exchanger are operable and in standby. The RCS is not yet adequately vented per OP 1-7, "Plant Cooldown." PORV "A" VPSR setpoint fails high. The "A" train PORV (PS-S-14) immediately opens. What action is required?

A. Shut PR-M-16, determine the cause of the PORV opening and align the RWST to the RHR pump to compensate for lost inventory.

B. Shut PR-M-16, start the "B" train RHR pump (P-12B) and align SCC to E-3B in order to maintain core cooling.

C. Shut PR-M-16, stop P-12A because RH-M-1 closes, then align an alternate flowpath for core cooling.

D. Shut PR-M-16, open RH-T-12 and LSI-F-59 to the full open position to facilitate venting of RHR piping and valves to RCS.

59. An operator has been sent to the lower level PAB to start the auxiliary charging pump (P-7) during a control room evacuation. The pump was aligned as follows:

- The speed control lever is set on the lowest speed;
- The pump is running with no abnormal noises with the RCS at normal operating pressure and temperature.

The PSS at the ASP notes that PZR level has not increased for 15 (fifteen) minutes. What is the cause of this problem?

A. The alternate cooler for P-7 was not aligned and the hydraulic oil is overheating.

B. The setpoint on CH-P-156 needs to be adjusted up to 2335 psig.

C. The speed control needs to be adjusted to the high speed setting.

D. The RCS must be depressurized using the atmospheric steam dump before a level increase will be seen.

60. The plant has experienced a small break LOCA and containment pressure has stabilized at 6.5 psig. The ECCS lightbox indication for PCC-M-219 shows BOTH the blue and green lights flashing. A check of PCC-M-219 on the MCB shows both the red and green valve position lights lit. In this condition PCC-M-219 is:

A. Completing its closure stroke and will indicate a green "closed" light in a few moments.

B. Completing its opening stroke and will indicate a red "open" light in a few moments

C. Without AC control power due to inadvertent opening of the MCC-7B supply breaker.

D. Tripped on overload and may require manual actions to close the valve.

61. Your crew is performing actions during a small break LOCA. You have transitioned from E-O, "Reactor Trip or Safety Injection," to E-1, "Loss of Primary or Secondary Coolant," and are checking to see if HPSI flow should be reduced. Several parameters, such as core region subcooling, secondary heat sink, pressurizer pressure and level must be satisfied. If you were to misdiagnose secondary heat sink availability and entered ES-1.1, "SI Termination," how could this effect your recovery actions?

A. Because HPSI flow could be maintaining core region subcooling, when flow is reduced the lack of heat removal could require reinitiation of the HPSI flow.

B. Because core region subcooling is the most direct indication that core cooling is being maintained, it is unlikely that the recovery actions will be inhibited by inadequate heat sink.

C. Because pressurizer RCS pressure and level are satisfied, the break size is such that in reduced HPSI flow conditions, there will always be sufficient RCS inventory for core cooling.

D. Because HPSI flow could be maintaining core region subcooling, when flow is reduced the lack of heat removal could require entry into FR-C.1, "Inadequate Core Cooling."

62. During the feed and bleed termination sequence of FR-H.1, "Loss of Secondary Heat Sink," throttling of HPSI flow to less than 150 gpm is required. Why is HPSI flow throttled during the termination sequence?

A. To ensure HPSI flow is adequate to remove decay heat even without a steam generator available.

B. If HPSI flow cannot be throttled the operator would be required to exit FR-H.1 and enter E-3, "Steam Generator Tube Rupture."

C. With HPSI flow throttled to less than 150 gpm, the normal charging flow path will be able to meet RCS inventory requirements.

D. Because the PORV's must be closed before the operator can exit FR-H.1 in the event of a subcriticality or core cooling red path.

63. Reactor trip breaker positions are shown on the attached drawing. Which statement identifies the most likely result if TCB-2 and TCB-6 are immediately reclosed?

A. The reactor trips due to loss of power to the output AC contactors.

B. The reactor remains operating due to redundant CEDM power supplies.

C. The reactor trips due to improper paralleling of MG sets.

D. The reactor remains operating due to automatic synchronization.

64. The reactor has tripped from 100% power due to a loss of feedwater. In an effort to restore feed flow to a S/G following a reactor trip, the operator is cautioned in FR-H.1 to verify that blowdown flow has been secured. Blowdown flow should have been isolated by:

A. Automatic action from the diverse scram system (DSS).

B. Automatic action on a low S/G level (35%).

C. Automatic action on a diverse turbine trip (DTT).

D. Automatic action on a low S/G pressure.

65. During CEA testing at HFP the RO receives dropped rod alarms on all four (4) power range channel drawers. The pulse counting and reed switch indication position systems do not "see" the dropped control rod and are not in alarm. Which of the following could be used to identify the quadrant in which the dropped rod occurred?

A. Calculating the azimuthal tilt will help identify the quadrant in which the dropped rod is located.

B. Monitoring the upper gripper coil current during individual rod movement will identify the quadrant.

C. Identifying the power range channel upper and lower detector outputs with the highest deviation will determine the quadrant.

D. Locating the octant position with the peak linear heat rate will identify the quadrant with the dropped rod.

66. The plant has undergone a large break LOCA. During review of the Critical Safety Function Status Trees the STA reports that core region temperatures are greater than 700 °F and recommends transitioning to FR-C.2, "Degraded Core Cooling." Prior to transitioning to FR-C.2, the Shift Operating Supervisor asks you to verify that core exit thermocouples (CET's) do in fact indicate greater than 700 °F on an inadequate core cooling event. What action is required to verify the existence of inadequate core cooling?

A. Verify the average temperature of all CET's read greater than 700 °F using the CET map.

B. Verify only one (1) CET reads greater than 700 °F using the CET map.

C. Verify all operational CET's read greater than 700 °F using the CET map.

D. Verify at least five (5) CET's read greater than 700 °F using the CET map.

67. A #3 steam generator tube rupture is in progress and the plant has been cooled and depressurized to minimize RCS flow into #3 S/G. At this time, the operator is required to check #3 S/G pressure to determine if it is stable or increasing. It is determined that the ruptured steam generator is continuing to lose pressure and cannot be maintained 250 psig greater than the intact S/G's. Why is the ruptured S/G pressure continuing to decrease?

A. #3 S/G is also undergoing a steam or feedline break (faulted).

B. The intact S/G's were overcooled and the high pressure in #3 S/G is backfeeding into the RCS.

C. When safety injection was blocked in the preceding steps, the operator did not maintain RCS temperature stable.

D. #3 S/G has multiple tube ruptures which is causing pressure in the S/G to decrease.

68. The following conditions exist during a refueling outage with the plant in Condition 3, Cold Shutdown:

- The RCS is at the refueling boron concentration;
- The "A" diesel generator (DG-1A) is tagged out for maintenance;
- The RHR pumps are available, but isolated for recirculation tests;
- X-16 is tagged out for verification of transformer taps;
- Pressurizer level is 85%.

Chemistry and operations have decided to reduce the RCS boron concentration to the cold shutdown requirement. What actions are required before reducing RCS boron concentration?

A. The charging pump (P-14B) must be aligned to the RCS and providing a minimum 150 gpm flow of borated water.

B. Place letdown in service with a minimum 40 gpm flow.

C. X-16 must be aligned to a 6900 volt bus and an RCP started.

D. An RHR pump must be aligned to the RCS providing a minimum 2000 gpm flow.

69. During a reactor startup, while in the manual sequential mode, a continuous rod withdrawal accident occurs and the RPS fails to activate a plant trip. Choose the list of operator actions that would act to mitigate this accident.

A. Place the ATWS/DSS switch on the rear of the MCB to "TEST", press both "ATWS/DSS trip MG 1A-1B" buttons on the MCB, open supply breakers to buses 9 and 12 (remotely).

B. Press at least one "ATWS/DSS trip MG-1A-1B" button on the MCB, open supply breakers to buses 9 and 12 (remotely), open supply breakers to MCC's 9 and 12 (locally).

C. Press both "ATWS/DSS trip MG 1A-1B" buttons on the MCB, open supply breakers to buses 9 and 12 (remotely), open supply breakers to buses 9 and 12 (locally).

D. Open supply breakers to buses 9 and 12 (remotely), de-energize both pressurizer pressure control channel instruments (PT-102X and PT-102Y), press both "ATWS/DSS trip MG 1A-1B" buttons on the MCB.

70. A waste gas release is in progress. The "charcoal filter fire gaseous discharge" annunciator (S-3-1) alarms due to high heat sensed at the charcoal filters. With no automatic actions available, the operator should:

A. Continue the waste gas release until verification of a problem by the primary auxiliary operator.

B. Secure the waste gas release because the dilution flow may be affected and result in an explosive mixture.

C. Continue the waste gas release, but align the release to the unaffected filter bank.

D. Secure the waste gas release because both filter banks should be in service when discharging waste gas.

71. A plant cooldown is in progress. The #1 and #2 S/G EFCV switches have been placed in "OPEN," #3 EFCV switch was inadvertantly left in "AUTO." Which of the following statements identifies plant response on decreasing steam generator pressure?

A. When 2/4 steam generator pressures in #3 S/G are <400 psig, all EFCV's will close.

B. When 4/4 steam generator pressures in #3 S/G are <400 psig, only #3 S/G's EFCV will close.

C. When 2/4 steam generator pressures in #3 S/G are <400 psig, only #3 S/G's EFCV will close.

D. When 1/4 steam generator pressures in #3 S/G are <400 psig, all EFCV's will close.

72. A containment recirculation fan power supply change was necessitated due to a LOCA scenario. Which of the following describes the change(s) made to prevent diesel generator overload?

A. FN-17-2, 4, and 6 were moved from BUS 8 and are powered from MCC-9C located in the protected switchgear room.

B. FN-17-1, 3, and 5 were moved from BUS 7 and are powered from MCC-9C located in the protected switchgear room.

C. FN-17-2, 4, and 6 were moved from BUS 8 and are powered from MCC-9C located in the unprotected switchgear room.

D. FN-17-1, 3, and 5 were moved from BUS 7 and are powered from MCC-9C located in the unprotected switchgear room.

73. There is an automatic start of the emergency diesel generators (DG-1A and 1B) following a surveillance run where inadequate fuel oil is left in the integral tank (i.e., no fuel oil pressure develops). How would the diesel air start system respond to this condition?

A. Selector switch on exciter cabinet selects first set of air start motors to engage (preferred). Starting sequence is as follows: Both sets of air start motors engage and crank engine for three (3) seconds, preferred set of air start motors engage and crank engine for three (3) seconds, non-preferred set of air start motors engage and crank engine for three (3) seconds.

B. Last surveillance run selects the set of air start motors to engage (preferred). Starting sequence is as follows: Both sets of air start motors engage and crank engine for three (3) seconds, preferred set of air start motors engage and crank engine for three (3) seconds, non-preferred set of air start motors engage and crank engine for three (3) seconds.

C. Selector switch on exciter cabinet selects first set of air start motors to engage (preferred). Starting sequence is as follows: Preferred set of air start motors engage and crank engine for three (3) seconds, both sets of air start motors engage and crank engine for three (3) seconds, non-preferred set of air start motors engage and crank engine for three (3) seconds.

D. Last surveillance run selects the set of air start motors to engage (preferred). Starting sequence is as follows: Preferred set of air start motors engage and crank engine for three (3) seconds, both sets of air start motors engage and crank engine for three (3) seconds, non-preferred set of air start motors engage and crank engine for three (3) seconds.

74. DG-1A has completed a two (2) hour surveillance run when the operator sees smoke coming from the vicinity of the turbo charger. An emergency diesel shutdown is being performed. If an auto start signal were to occur with the diesel breaker open, but not in pull-to-lock, the diesel would:

A. Restart and come up to 900 rpm unless both "STOP" push buttons are energized and the fuel rack is held in the "NO FUEL" position until the diesel stops.

B. Restart and come up to 900 rpm unless the fuel rack is held in the "NO FUEL" position until diesel is <450 rpm.

C. Restart and come up to 900 rpm unless both "STOP" push buttons are energized and the fuel cutoff valve is "CLOSED."

D. Restart and come up to 900 rpm regardless of the fuel rack position, fuel shutoff valve position, or "STOP" push buttons.

75. Which of the following, when at hot full power, would be designated as an Operator Workaround?

A. The north entrance to the steam and valve house is temporarily blocked by scaffolding in the Reactor MCC Room.

B. An operator is stationed at the feedwater section of the MCB to manually control #1 S/G main feed regulating valve for 15 minutes.

C. Train "A" CIS annunciator for "Trip Signal: RCP Trip Criteria" is continuously lit on the MCB annunciator panel.

D. The MCB switch for the diesel fire pump (P-5) is being replaced due to a design deficiency (auto-start is available).

76. Instrument air header pressure is decreasing and the cause is unknown. What automatic action occurs FIRST to restore instrument air header pressure?

A. SA-P-56 will shut at 75 psig and isolate the service air header.

B. IA-A-27 will open at 75 psig and supply the instrument air header.

C. SA-P-56 will shut at 75 psig and isolate the instrument air header.

D. IA-A-27 will open at 75 psig and supply the service air header.

77. The following conditions exist when in hot shutdown:

- PAB upper level ambient temperatures are >130 °F;
- RCS temperature is being maintained via AS-P-3 and MS-A-162 opening;
- CH-F-38 flow is increasing with charging header pressure decreasing;
- Main steam non-return valves (MS-M-10, 20 and 30) are closed;
- Blowdown is aligned to the primary vent stack;
- A four times normal radiation level spike was recorded on the PVS gas monitor (RM-3902Y).

Initial discussion among the crew seems to indicate that a steam generator tube leak may be in progress. What mechanism should the operator use to confirm the S/G tube leak?

A. Allow a few minutes to pass then note any increasing radiation levels on the blowdown monitors.

B. Use the main steam line monitor to note any increasing radiation level trends.

C. Continue trending the PVS radiation level and off-gas filter radiation levels.

D. Monitor the steam generator levels and EFW flow.

78. A loss of secondary heat sink has occurred. The reactor head subcooled margin monitor is reading 10 °F and is decreasing. As the reactor head subcooled margin monitor approaches 0 °F, pressurizer level indication will:

A. Increase due to voiding in the PZR heater area.

B. Increase due to voiding in the reactor vessel.

C. Increase due to voiding in the S/G tube bundle region.

D. Increase due to voiding in the PZR reference leg.

79. How are radiation levels trended inside the containment during an accident that releases large amounts of radionuclides?

A. The high range radiation monitors (RM-6113A/B) have chart recorders that are automatically activated.

B. The high range radiation monitors (RM-6113A/B) have chart recorders that are manually activated.

C. The manipulator crane radiation monitor (RM-6104) has a chart recorder that is automatically activated.

D. The high range radiation monitors (RM-6113A/B) automatically activates a historical record on the plant computer.

80. The primary inventory trend system (PITS) provides reactor vessel level indication during accident conditions. Which condition ensures proper reference leg operation for PITS indication?

A. The RCP's are coasting down and the seal pot is continuously filling the reference leg.

B. The RCP's are off and CET density compensation of PITS is operating.

C. The RCP's are running and the RTD density compensation of PITS is operating.

D. The RCP's are off and the seal pot is continuously filling the reference leg.

81. An on-line purge of containment is in progress. During your control board walkdown, you note that the valve position indications for VP-A-1, 2, 3, and 5 are both lit (red and green indications on). What would this condition indicate?

A. That a high containment gas or PVS gas radiation level alarm has just cleared and the valves are traveling to the full open position.

B. That a containment low range or manipulator crane alarm was just received and the valves are traveling to the closed position.

C. That a purge is about to begin as soon as the valves reach their full open position.

D. That a purge is in progress and all four (4) valves are positioned according to procedural restrictions.

82. What are the possible adverse consequences to the containment spray valves (CS-M-1 & 2) if offsite power is in a degraded voltage condition?

A. The MOV's may develop insufficient torque to start valve movement.

B. Adequate voltage will not be available to the control power circuit to operate the 42 device in-line contactors.

C. The motors may operate at a slower than acceptable speed as outlined in the accident analysis.

D. DC control power will close the breakers but the motors may be unable to open the valves.

83. Following a reactor trip caused by an actual seismic event, the operator notes that numerous rod bottom lights are not lit. The first out annunciator panel indicates that a thermal margin/low pressure trip (TM/LP) was the first signal received. Without any operator action, what control room indications could confirm that adequate rods were inserted on the trip?

A. Computer pulse height indication and CEA DVM indication.

B. Rod drive MG set "LOAD" amps (generator ammeter) are zero (0).

C. Reactor trip breaker position.

D. Wide range SUR reading -1/3 DPM.

84. A plant trip occurs on low S/G level near the end of cycle. The operator notes increasing counts on the letdown radiation monitor (RM-3102). The demineralizer bypass valve (LD-T-36) is open (to demineralizer), but the letdown pressure control valve (LD-F-16) has automatically closed. The VCT cubicle area radiation levels have increased. What is the probable cause of this event?

A. A crud burst has occurred and caused LD-F-16 to close on high pre-filter D/P.

B. A fuel failure has occurred and caused LD-F-16 to close on high demineralizer D/P.

C. A crud burst has occurred and caused LD-F-16 to close on high demineralizer D/P.

D. A letdown drag valve has failed open and caused LD-F-16 to close on high pre-filter D/P.

85. Which of the following groups of indications, trips, and alarms will be affected if any one pressurizer pressure safety channel is lost (PT-102 A, B, C, or D)?

A. High pressure trip unit, PORV block valve auto open, diverse scram system.

B. TM/LP trip unit, SIAS actuation, LO-LO pressure alarm.

C. SPDS input, SIAS actuation, low pressure heater cutout.

D. PORV actuation, diverse turbine trip, high pressure trip unit.

86. The spare containment spray pump (P-61S) is aligned as a "B" train LPSI pump during normal operations. A total loss of offsite power and SIAS actuation signals are initiated due to a seismic event. How does P-61S respond during this transient?

A. P-61S starts immediately due to 27Y-5 actuation.

B. P-61S starts on time delay due to 27Y-5 actuation.

C. P-61S starts immediately due to 27Y-6 actuation.

D. P-61S starts on time delay due to 27Y-6 actuation.

87. Which of the following describes the method used to to ensure the SIT isolation valves (SIA-M-11, 21, and 31) are available for use during Condition 7 operations?

A. The MOV's have a breaker and disconnect that are locked closed to ensure power and valve position indication is always available to the valve.

B. The MOV's have a breaker and disconnect that are locked open. Valve position indication is provided by an alternate DC power source.

C. The MOV's have a breaker and disconnect that are locked open but downstream of the control power transformer allowing continuous valve position indication.

D. The MOV's have a breaker and disconnect that are locked closed. Valve position indication is provided by an alternate DC power source.

88. The spent fuel pool (SFP) demineralizer (I-4) has just received a fresh charge of unborated H-OH resin and has been improperly placed in service. Over the next several hours:

A. SFP 15 minute gross gamma should decrease, boron concentration should increase, and negative reactivity in the SFP should increase.

B. SFP 15 minute gross gamma should decrease, boron concentration should decrease, and negative reactivity in the SFP should increase.

C. SFP 15 minute gross gamma should increase, boron concentration should increase, and negative reactivity in the SFP should decrease.

D. SFP 15 minute gross gamma should decrease, boron concentration should decrease, and negative reactivity in the SFP should decrease.

89. Following a load rejection anticipated operational occurrence (AOO), the reactor fails to trip on signals generated by the reactor protection system. What backup system will provide core protection during the AOO?

A. Diverse scram system (DSS) on high pressurizer pressure two (2) out of four (4), opening M/G set output breakers.

B. Diverse scram system (DSS) on low S/G water level two (2) out of two (2), opening M/G set output breakers.

C. Diverse turbine trip (DTT) on low S/G level two (2) out of two (2), energizing 20 AST and dumping auto-stop oil.

D. Diverse scram system (DSS) on high pressurizer pressure four (4) out of four (4), opening M/G set output breakers.

90. The plant is at 90% power when the following symptoms are noted:

- Main condenser absolute pressure is increasing;
- PCC and SCC temperatures are decreasing;
- Feed water heater levels are decreasing;
- Containment temperatures are increasing;
- Main generator temperatures are increasing.

What is causing these conditions?

A. A loss of service water has occurred.

B. A loss of containment control air has occurred.

C. A loss of condenser vacuum has occurred.

D. A loss of control air has occurred.

91. The plant is at hot zero power when pressurizer level control channel LIC-101X fails. What indications would the operator see if the channel failed low?

A. Maximum charging, minimum letdown, all heaters off, pressurizer pressure decreasing, spray valves closing.

B. Maximum charging, minimum letdown, backup heaters off, pressurizer pressure increasing, spray valves opening.

C. Maximum charging, minimum letdown, all heaters off, pressurizer pressure increasing, spray valves opening.

D. Maximum charging, minimum letdown, backup heaters off, pressurizer pressure decreasing, spray valves closing.

92. During a large break LOCA with RAS, the following conditions exist:

- HIS-M-50 & 51 are flashing green in the SIAS lightbox;
- LSI-M-40 & 41 are flashing green in the RAS lightbox;
- PCC-M-219 is solid green in the CIS lightbox;
- PW-A-78 is solid green in the SIAS/CIS lightbox;
- RWST level is less than 100,000 gallons;
- Containment pressure is 26 psia and decreasing.

The STA states that an ORANGE path exists for containment and recommends entry into FR-Z.2, "Containment Flooding." Based on the information available, which of the following would be the likely source of any extra water that has been dumped into the containment during this accident?

A. The PCC system has ruptured and dumped its contents into the containment.

B. The RWST outlet isolation RAS bypass switch was left in "BYPASS".

C. The containment sump level indication is high due to harsh containment environment.

D. The primary water header has ruptured inside the containment.

93. The reactor is in a cold shutdown condition (150 psia & 200 °F) with RHR flow being maintained by LSI-F-59 at 2500 gpm. Electrical Maintenance has requested that Operations minimize plant electrical load by reducing flow to 1000 gpm. What adverse effect could this reduction in flow have on plant safety?

A. The RHR pump would start to overheat because this is the minimum flow at which an RHR pump should be operated.

B. The RHR pump would start to cavitate due to vortexing at the RHR pump suction valves (RH-M-1 & 2).

C. The RHR system would not provide adequate LTOP protection in the event of an inadvertant charging pump start.

D. The RHR system would not provide adequate LTOP protection when RH-M-1 & 2 shut on low RHR flow.

94. Both PORV's have lifted following a loss of load accident and the quench tank has remained intact. Both PORV's now indicate closed on the MCB. The accoustic accelerometers are not availabie for verifying valve closure. Which of the following would provide the most accurate information to verify the PORV's closed?

A. Reactor core subcooled margin, Th, containment pressure.

B. Reactor head subcooled margin, CET temperature, quench tank pressure.

C. Reactor core subcooled margin, CET temperature, quench tank pressure.

D. Reactor head subcooled margin, Th, containment pressure.

95. During a LOCA inside containment (SI AS & CIS actuation) PCC surge tank level is decreasing rapidly. What automatic action occurs to ensure that the PCC system remains available during the accident?

A. PCC-M-219 (supply to RCP's) closes to maintain PCC surge tank level and NPSH to the PCC pump.

B. The PCC pumps trip on low suction pressure to facilitate refilling the surge tank and restarting the pumps.

C. PCC-A-252 (return from RCP's) closes to maintain adequate NPSH to the PCC pumps.

D. The PCC pumps trip on high PCC flow to facilitate leak isolation and restart of PCC pumps.

96. An inadequate core cooling event has left the core uncovered for about 1/2 hour prior to reflooding. A BENDIX hydrogen sample of containment indicates 6% hydrogen. What is the probable cause of the hydrogen formation?

A. The radiolytic decomposition of water has accelerated due to high core temperatures, therefore, liberating hydrogen.

B. A self-sustaining Zirc-water reaction has occurred due to high core temperatures, therefore, liberating hydrogen.

C. Cracking of the fuel cladding has released elemental helium which disassociates into hydrogen under the strong gamma flux.

D. Sodium hydroxide from the SCAT has reacted with the carbon steel liner and created elemental oxygen and hydrogen.

97. Which of the following describes the sequence of events that occurs when main generator relay 86 BU actuates when connected to the grid?

A. Tripping of relay 86 BU sends a signal directly to all four (4) RPS channels to initiate a loss of load reactor trip.

B. Tripping of relay 86 BU sends a signal to 20 AST which energizes and initiates opening of the MG-set output breakers.

C. Tripping of relay 86 BU sends a signal to the auto stop oil pressure switches subsequently initiating a turbine, then reactor trip.

D. Tripping of relay 86 BU sends a signal to 20 ET which closes all four (4) stop valves subsequently initiating a reactor trip.

98. The plant is at 45% power. One containment air compressor (C-5A) is white tagged out for maintenance when C5-B trips on overload. Cross-connect air is unavailable at this time. What action is required?

A. The sixth containment recirculation fan must be started.

B. The reactor and the RCP's must be tripped.

C. The reactor must be tripped and Group 5B must be inserted.

D. The RCS must be borated until the plant is shutdown.

99. The ZURN strainer isolations on the inlet to the service water (SW) heat exchangers must be shut immediately in the event of an SIAS during "power flushing". Why is this required?

A. The ZURN strainer outlet piping is not seismically qualified and will fail if a water hammer event occurs.

B. This would prevent an inadvertant release path if a PCC or SCC heat exchanger failed (bypassing service water RMS).

C. The service water pumps are not designed to handle the flow rates that accompany "power flushing."

D. The SW heat exchangers need to receive full cooling water flow to meet the heat loading requirements from an accident.

100. What would be an adverse consequence of failing to recirculate the RHR system prior to placing it in service?

A. The RHR heatup limit of 1260 °F/hr. will be exceeded when RH-M-1 and 2 are opened with RH-4 closed.

B. Excess positive reactivity may be added to the RCS even with the RCS borated to the cold shutdown condition.

C. The RHR spring reliefs (RH-S-24 and 25) may lift prematurely due to the delta T between the body and bonnet.

D. The RHR heat exchangers may develop RCS to component cooling system leaks caused by thermal shock to the RHR heat exchanger U-tubes.

RO NRC Examination Answer Sheet Name:_____

1.	A	B	C	D
2.	A	B	C	D
3.	A	B	C	D
4.	A	B	C	D
5.	A	B	C	D
6.	A	B	C	D
7.	A	B	C	D
8.	A	B	C	D
9.	A	B	C	D
10.	A	B	C	D
11.	A	B	C	D
12.	A	B	C	D
13.	A	B	C	D
14.	A	B	C	D
15.	A	B	C	D
16.	A	B	C	D
17.	A	B	C	D
18.	A	B	C	D
19.	A	B	C	D
20.	A	B	C	D
21.	A	B	C	D
22.	A	B	C	D
23.	A	B	C	D
24.	A	B	C	D

RO NRC Examination Answer Sheet Name:_____

25.	A	B	C	D
26.	A	B	C	D
27.	A	B	C	D
28.	A	B	C	D
29.	A	B	C	D
30.	A	B	C	D
31.	A	B	C	D
32.	A	B	C	D
33.	A	B	C	D
34.	A	B	C	D
35.	A	B	C	D
36.	A	B	C	D
37.	A	B	C	D
38.	A	B	C	D
39.	A	B	C	D
40.	A	B	C	D
41.	A	B	C	D
42.	A	B	C	D
43.	A	B	C	D
44.	A	B	C	D
45.	A	B	C	D
46.	A	B	C	D
47.	A	B	C	D
48.	A	B	C	D

RO NRC Examination Answer Sheet Name:_____

49.	A	B	C	D
50.	A	B	C	D
51.	A	B	C	D
52.	A	B	C	D
53.	A	B	C	D
54.	A	B	C	D
55.	A	B	C	D
56.	A	B	C	D
57.	A	B	C	D
58.	A	B	C	D
59.	A	B	C	D
60.	A	B	C	D
61.	A	B	C	D
62.	A	B	C	D
63.	A	B	C	D
64.	A	B	C	D
65.	A	B	C	D
66.	A	B	C	D
67.	A	B	C	D
68.	A	B	C	D
69.	A	B	C	D
70.	A	B	C	D
71.	A	B	C	D
72.	A	B	C	D

RO NRC Examination Answer Sheet Name:_____

73.	A	B	C	D
74.	A	B	C	D
75.	A	B	C	D
76.	A	B	C	D
77.	A	B	C	D
78.	A	B	C	D
79.	A	B	C	D
80.	A	B	C	D
81.	A	B	C	D
82.	A	B	C	D
83.	A	B	C	D
84.	A	B	C	D
85.	A	B	C	D
86.	A	B	C	D
87.	A	B	C	D
88.	A	B	C	D
89.	A	B	C	D
90.	A	B	C	D
91.	A	B	C	D
92.	A	B	C	D
93.	A	B	C	D
94.	A	B	C	D
95.	A	B	C	D
96.	A	B	C	D

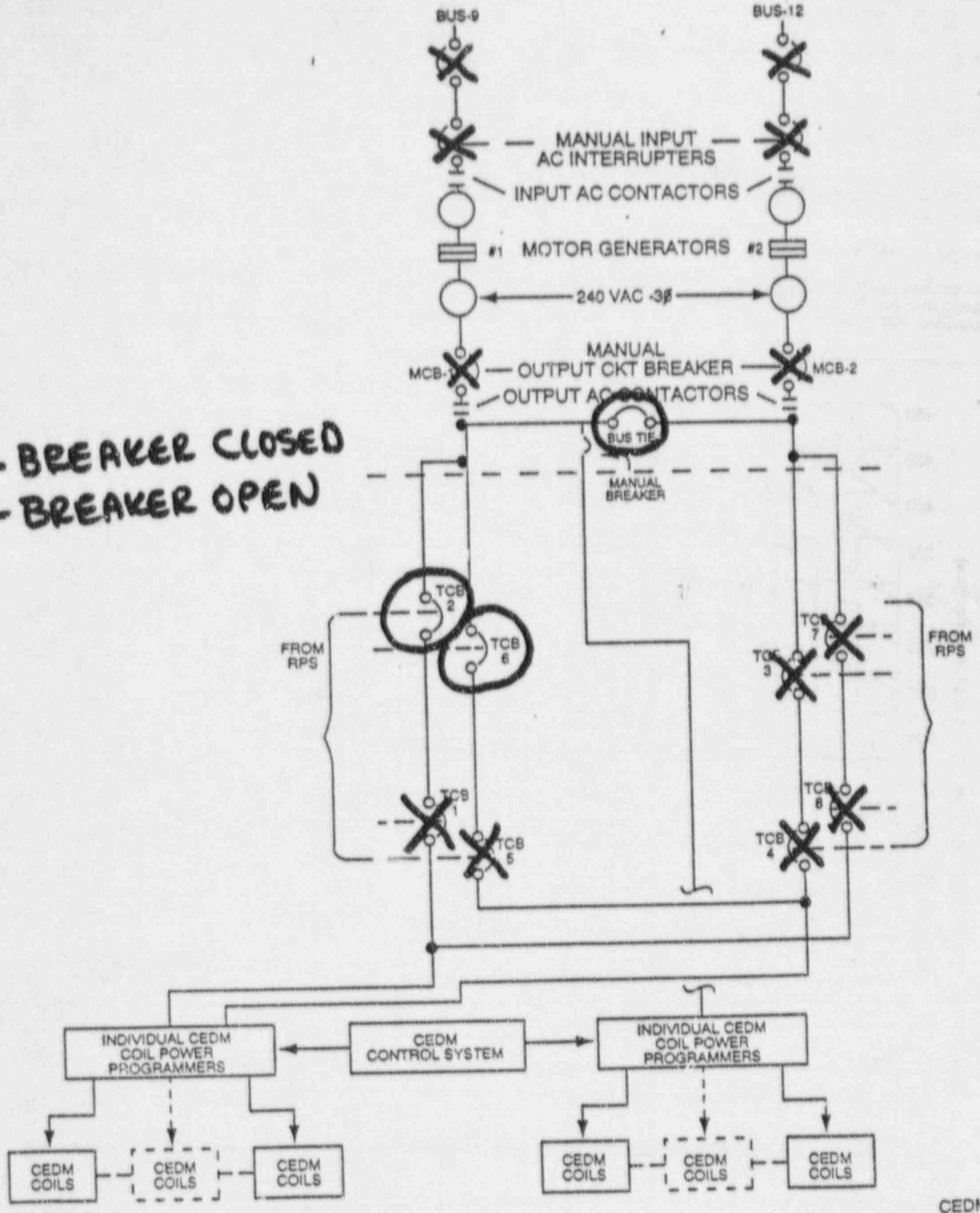
97. A B C D

98. A B C D

99. A B C D

100. A B C D

CEDM POWER SUPPLY



CEDM-1
3/26/96
RO-L-4.4
AO-L-4.1

Reviewed by _____ Date 6-12-95 Prepared by _____

STEAM GENERATOR LEVEL CORRECTION FOR WIDE RANGE CHANNELS

LI - 1214, 1224 & 1234

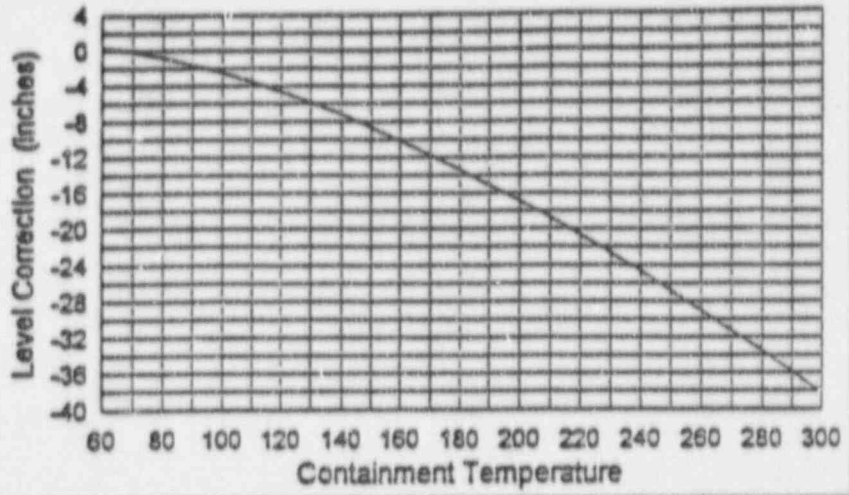
Example:

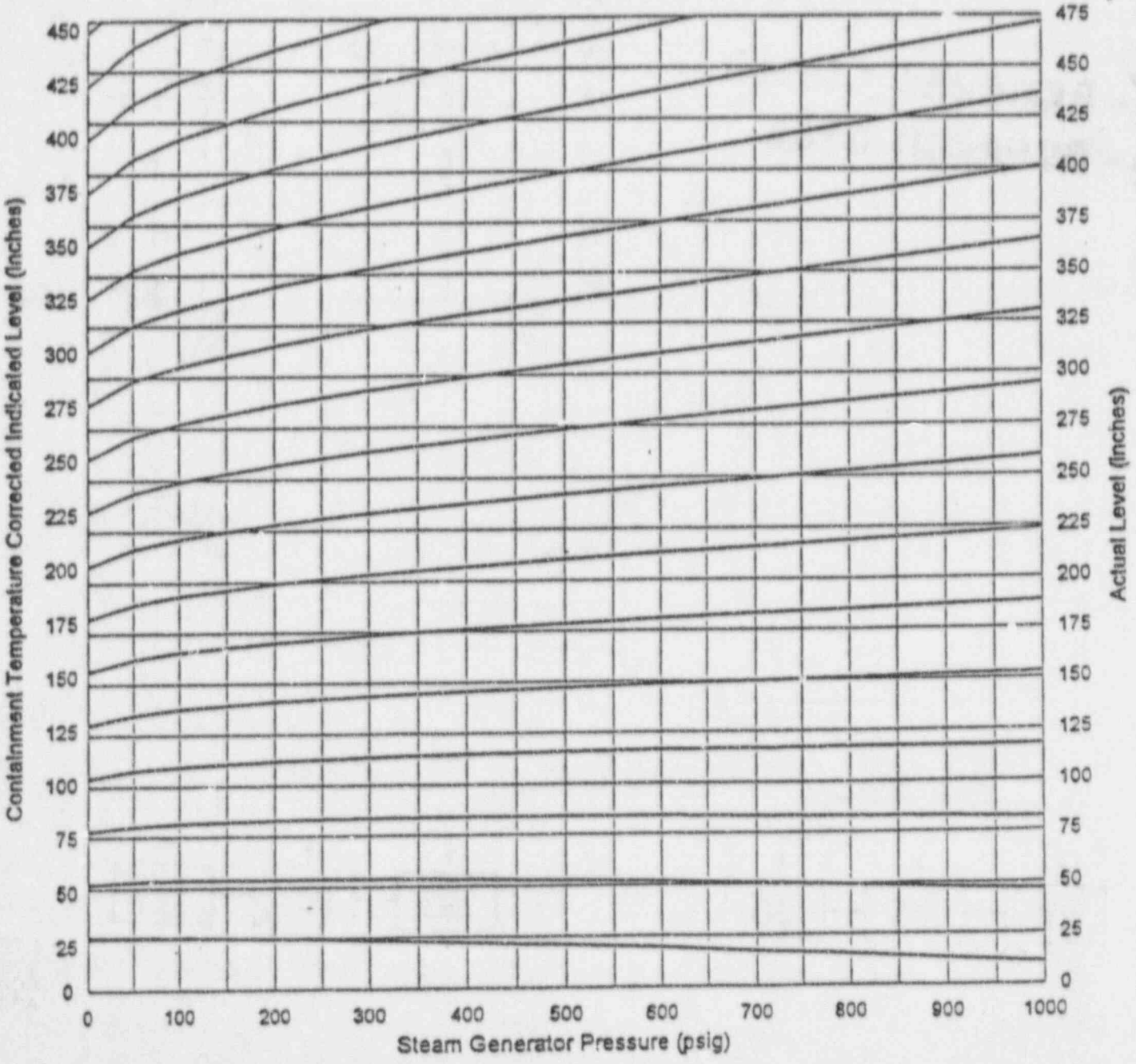
Indicated Level 331 inches
Containment Temperature 130F
Steam Generator Pressure 800 psig

Assume that the reference leg temperature equals containment temperature. From graph at right,
Indicated Level Correction -6 inches

Corrected Indicated Level 331 - 6 = 325 inches

Enter the graph along lines of corrected indicated level and steam generator pressure
Actual Level 400 inches





RO NRC Examination Answer Sheet Name:_____

1.	A	B	**C**	D
2.	A	**B**	C	D
3.	A	B	C	**D**
4.	**A**	B	C	D
5.	**A**	B	C	D
6.	A	B	**C**	D
7.	**A**	B	C	D
8.	**A**	B	C	D
9.	A	B	C	**D**
10.	A	**B**	C	D
11.	A	B	**C**	D
12.	A	B	C	**D**
13.	A	**B**	C	D
14.	A	B	C	**D**
15.	**A**	B	C	D
16.	A	**B**	C	D
17.	A	B	C	**D**
18.	A	B	**C**	D
19.	A	B	C	**D**
20.	A	**B**	C	D
21.	A	B	**C**	D
22.	A	**B**	C	D
23.	A	B	**C**	D
24.	**A**	B	C	D

RO NRC Examination Answer Sheet Name:_____

25.	A	B	(C)	D
26.	A	(B)	C	D
27.	A	B	C	(D)
28.	A	B	(C)	D
29.	(A)	B	C	D
30.	A	B	C	(D)
31.	A	(B)	C	D
32.	A	B	(C)	D
33.	A	B	C	(D)
34.	(A)	B	C	D
35.	A	B	(C)	D
36.	A	B	C	(D)
37.	A	B	(C)	D
38.	(A)	B	C	D
39.	A	B	(C)	D
40.	(A)	B	C	D
41.	A	B	C	(D)
42.	A	B	(C)	D
43.	A	(B)	C	D
44.	A	B	C	(D)
45.	A	B	(C)	D
46.	(A)	B	C	D
47.	A	B	(C)	D
48.	A	(B)	C	D

RO NRC Examination Answer Sheet Name:_____

49.	A	(B)	C	D
50.	A	(B)	C	D
51.	A	(B)	C	D
52.	A	B	(C)	D
53.	(A)	B	C	D
54.	A	(B)	C	D
55.	A	B	C	(D)
56.	A	(B)	C	D
57.	A	B	(C)	D
58.	A	B	(C)	D
59.	A	(B)	C	D
60.	A	B	C	(D)
61.	(A)	B	C	D
62.	A	B	(C)	D
63.	A	B	(C)	D
64.	A	(B)	(C)	D
65.	(A)	B	C	D
66.	A	B	C	(D)
67.	(A)	B	C	D
68.	A	B	C	(D)
69.	A	B	(C)	D
70.	A	(B)	C	D
71.	(A)	B	C	D
72.	(A)	B	C	D

64. – #64 BOTH B & C CORRECT. ~~SEE~~ JUSTIFICATION SHEET L Zilli 6/12/9 Jon Kniech

RO NRC Examination Answer Sheet Name:_____

73.	A	B	**C**	D
74.	**A**	B	C	D
75.	A	B	**C**	D
76.	**A**	B	C	D
77.	A	B	C	**D**
78.	A	**B**	C	D
79.	**A**	B	C	D
80.	A	B	C	**D**
81.	A	B	C	**D**
82.	**A**	B	C	D
83.	A	B	C	**D**
84.	**A**	B	C	D
85.	A	**B**	C	D
86.	A	B	C	**D**
87.	A	**B**	C	D
88.	A	B	C	**D**
89.	**A**	B	C	D
90.	A	B	C	**D**
91.	A	B	**C**	D
92.	A	**B**	C	D
93.	A	B	**C**	D
94.	A	B	**C**	D
95.	**A**	B	C	D
96.	A	**B**	C	D

RO NRC Examination Answer Sheet Name:_____

97.	A	B	C	(D)
98.	A	(B)	C	D
99.	A	B	C	(D)
100.	A	(B)	C	D

Attachment 3

MAINE YANKEE WRITTEN EXAM COMMENTS AND RESOLUTION

Question #64(RO) and #74(SRO)

The reactor has tripped from 100% power due to a loss of feedwater. In an effort to restore feed flow to a S/G following a reactor trip, the operator is cautioned in FR-H.1 to verify that blowdown flow has been secured. Blowdown flow should have been isolated by:

A. Automatic action from the diverse scram system (DSS).

B. Automatic action on a low S/G level (35%).

C. Automatic action on a diverse turbine trip (DTT).

D. Automatic action on a low S/G pressure.

Facility Comment

Blowdown flow isolation is initiated on a low S/G level signal, which fires diverse turbine trip (DTT). The DTT relay provides a signal to close the blowdown valves. This makes both answers B and C correct. (Shown on Drawing No. 11550-ESK-11AG).

NRC Resolution

Agree with facility comment in that the correct answer should be either B or C. Answer key was changed accordingly.