

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Operator Licensing Examination Report No. 50-445/OL 92-01; 50-446/OL 92-01

Operating License No. NPF-87

Construction Permit No. CPPR-127

Licensee: TU Electric
Skyway Tower
400 North Olive, L.B. 81
Dallas, Texas 75201

Examinations at: Comanche Peak Steam Electric Station

Examinations Conducted: Weeks of June 22 and 29, 1992

Chief Examiner: R.E. Lantz, Reactor Engineer, Division of Reactor Safety

Approved by: John Pellet 7/9/92
J. L. Pellet, Chief Date
Operator Licensing Section
Division of Reactor Safety

Summary

NRC Administered Examinations Conducted During the Weeks of June 22 and 29, 1992 (Examination Report 50-445/OL 92-01; 50-446/OL 92-01)

NRC administered examinations to 13 reactor operator applicants and 7 senior reactor operator applicant. All applicants passed all portions of the examination and have been issued the appropriate license.

This is the second NRC administered examination set for an initial license class at your facility with a 100 percent pass rate; a repeat performance from last year's examinations. Given the large number of applicants, it is evident your training and applicant screening process has continued to improve and more effectively prepare applicants for NRC examinations.

Also noteworthy, is that applicants, as a group, performed at a high level on all parts of the examinations and no significant generic weaknesses were observed.

DETAILS

1. PERSONS EXAMINED

		<u>SRO</u>	<u>RO</u>	<u>Total</u>
Licensee Examinations:	Pass -	7	13	20
	Fail -	0	0	0

2. EXAMINERS

R. E. Lantz, Chief Examiner
J. L. Pellet
J. M. Keeton
K. M. Kennedy
J. T. Moorman
F. S. Jaggar
W. C. Hemming

3. EXAMINATION REPORT

Performance results for individual examinees are not included in this report as it will be placed in the NRC Public Document Room and individual results are not subject to public disclosure.

3.1 Examination Review Comment/Resolution

In general, editorial comments or changes made as a result of facility reviews prior to the examination, during the examination, or subsequent grading reviews are not addressed by this resolution section. This section reflects resolution of substantive comments submitted to the NRC by the facility licensee after the examination. The facility licensee post-examination comments, less the supporting documentation, are included in the report immediately following the master examination key. The facility licensee comments were accepted and are incorporated into the master examination key.

3.2 Site Visit Summary

The facility licensee was provided a copy of the examination and answer key for the purpose of commenting on the examination content validity. The facility licensee was informed that examination results could be expected within 30 days of the completion of the examination.

The NRC met with members of the licensee's training staff and summarized the results of the examinations as presented in this report. The following personnel were present:

<u>NRC</u>	<u>FACILITY</u>
R. E. Lantz	J. McMahon
J. L. Pellet	J. Blackwell
W. B. Jones	J. Donahue
	J. Walker
	G. Polley
	D. McIntire
	J. Stavely
	S. Falley

3.3 General Comments

3.3.1 Written Examination

- o Performance on the written examination was noteworthy. The average score on the reactor operator examination was 94 percent and on the senior reactor operator examination was 92 percent. This represents a continued strong performance on the written examinations.
- o The following question numbers are provided to assist facility evaluation of training weaknesses. The numbers are given where a significant number of applicants missed the given question. Question numbers refer to the reactor operator examination, except numbers 69 and 82, which were only on the senior reactor operator examination.

16 20 23 39 40 46 69 82 98

3.3.2 Operating Examination

3.3.2.1 Simulator

No significant weaknesses were noted during the simulator section of the operating examinations. Procedural usage was a noted strength. Communications, as a whole, were adequate, however several instances of unclear commands and/or single ended conversations led to minor instances of confusion. The most severe instance led to the closing of the main steam isolation valves when not required nor desired by the procedure. In this instance it did not significantly affect the mitigation of the event, however, given another event the consequences could have been much more severe.

3.3.2.2 Walkthrough

On the plant walkthrough section of the operating examinations, the following observations were made:

- o Several operators displayed a general unfamiliarity with the location and configuration of the protection set cabinets, and after locating the correct cabinet and frame, had difficulty in identifying the correct bistable cards for a failed instrument.
- o Two operators failed to trip the reactor coolant pumps (per procedure) following manual initiation of containment spray. This condition results in loss of cooling to the reactor coolant pumps and potentially severe consequences beyond damage to the reactor coolant pump itself.
- o A noted improvement in operator performance was observed during starting of a reactor coolant pump. SOP-108A requires the reactor coolant pump to be tripped if flow is not observed to be increasing within 10 seconds after starting the reactor coolant pump. Although a simulator modeling infidelity identified during last year's (June 1991) examinations was known by the applicants to cause flow to stay low for 10-15 seconds, several applicants did trip the reactor coolant pump and report the low flow condition. Some negative simulator training was observed, however, apparently due to the known infidelity, since not all of the applicants tripped the reactor coolant pump when procedurally required.
- o Security awareness was also a noted strength. One applicant noted an inattentive security guard at the Primary Access Point and brought this to the attention of the appropriate security personnel. The NRC resident inspector was also informed.

3.3.3 Conclusion

This is the second in as many NRC administered examination sets for an initial license class that Comanche Peak Steam Electric Station has achieved a 100 percent pass rate. The continued emphasis by Comanche Peak Steam Electric Station in screening applicants prior to the NRC examination appears to have been very effective.

3.4 Master Examination and Answer Key

A master copy of the written examination and answer key is attached. The facility licensee post-examination comments were accepted and are incorporated into the answer key.

3.5 Facility Post-Examination Review Comments

The facility post-examination review comment regarding the written examination are attached following the master examination key.

3.6 Simulation Facility Report

All items on the attached Simulation Facility Report have been discussed with facility personnel.

SIMULATION FACILITY REPORT

Licensee: TU Electric

Docket No: 50-445; 50-446

Operating Tests Administered at: Comanche Peak Steam Electric Station

Operating Tests Administered: Weeks of June 22 and 29, 1992

This report does not constitute an audit or inspection and is not, without further verification and review, indicative of non-compliance with 10 CFR Part 55.45(h). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

During the conduct of the operating examinations identified above, the following items were observed:

- o During starting of a reactor coolant pump, loop flow remains low for greater than 10 seconds, procedurally requiring a reactor coolant pump trip. This modeling error was previously identified during June 1991 NRC initial examinations.
- o Malfunction No. RM03C, failure of control room air-intake radiation monitor high, is not properly modeled.
- o Malfunction No. RD09, failure of Data A and B coils to DRPI, is capable of being modeled, but only by failing each rod's DRPI individually.
- o During the start of scenarios with IC15, at 55 percent power, several operators had difficulty with the moisture separator reheater lineup and opening of extraction steam isolation valves. This indicates a possible modeling problem on the setup of IC15 resulting in a condition not normally expected at 55 percent power.



Log # TXX-92316
File # 10305

TU ELECTRIC July 1, 1992

William J. Cahill, Jr.
Group Vice President

U. S. Nuclear Regulatory Commission, Region IV
Attn: Mr. John Pellet
611 Ryan Plaza Dr. Suite 400
Arlington, TX 76011

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
TRANSMITTAL OF POST EXAMINATION REVIEW COMMENTS

REF: NRC written examination administered to licensed operator
candidates at CPSES during the week of June 22, 1992.

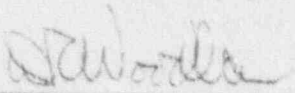
Dear Mr. Pellet:

TU Electric hereby provides comments with respect to the above referenced examination. The specific comments, supporting information and references are provided in the attachment to this letter.

If there are any questions regarding these comments, please contact Mr. Jerry Walker at (817) 897-5367.

Sincerely,

William J. Cahill, Jr.

By: 
D. R. Woodlan
Docket Licensing Manager

CLW/ds
Attachment

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (2)
Mr. A. B. Beach, Region IV

SUMMARY: Comments are made below on three questions common to both the RO and SRO written examinations. Comments on one question are of a technical nature regarding the conditions established in the stem of the question. The remaining two questions are technically correct, however, it appears a typographical error exists in the examination KEY based on an acceptable review of these questions during the pre-examination review process.

QUESTION #10 (RO), #9 SRO

COMMENT: No correct answer given based on information supplied in question stem.

SUPPORTING INFORMATION:

1. Annunciator alarm PRZR PRESS HI is fed from PRZR pressure channel PT-456 (bistable 456F) which is assumed operable in accordance with the key answer (PT-455 failed high).
2. PRZR PRESS HI (ALB-5C, Window 2.1) would not be illuminated if PT-455 failed high.
3. Other alarms are consistent with failed condition.
4. Change PRZR PRESS HI to PRZR PRESS 1 OF 4 HI for future use.

REFERENCES:

- Alarm Response Procedure ALM-0053A, Window 2.1
- Drawing 7247D05, Sheet 11

QUESTION #92 (RO), #95 SRO

COMMENT: Answer KEY incorrect.

SUPPORTING INFORMATION:

1. Correct answer is response C in accordance with procedure FRZ-0.1A, "Response to High Containment Pressure", Step 6.
2. Answer KEY was corrected during the pre-examination review process.

REFERENCES:

- FRZ-0.1A, Step 6

QUESTION #96 (RO), #98 SRO

COMMENT: Answer KEY incorrect.

SUPPORTING INFORMATION:

1. Correct answer is response C in accordance with procedure ECA-0.1A, "Loss of All AC Power Recovery Without SI Required", Step 15.
2. Answer KEY was verified correct during pre-examination review process with no change required (answer different on exam administered 6/22/92).

REFERENCES:

- ECA-0.1A, Step 15

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Nuclear Regulatory Commission
Operator Licensing
Examination

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date of examination.

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U. S. NUCLEAR REGULATORY COMMISSION
SITE SPECIFIC EXAMINATION
SENIOR OPERATOR LICENSE
REGION 4

CANDIDATE'S NAME: _____
FACILITY: Comanche Peak 1
REACTOR TYPE: PWR-WEC4
DATE ADMINISTERED: 92/06/22

INSTRUCTIONS TO CANDIDATE:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

<u>TEST VALUE</u>	<u>CANDIDATE'S SCORE</u>	<u>%</u>	
<u>99.00</u>			
<u>100.00 26</u>			
	<u>FINAL GRADE</u>	<u>%</u>	TOTALS

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

Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.
2. After the examination has been completed, you must sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination. This must be done after you complete the examination.
3. Restroom trips are to be limited and only one applicant at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.
4. Use black ink or dark pencil ONLY to facilitate legible reproductions.
5. Print your name in the blank provided in the upper right-hand corner of the examination cover sheet and each answer sheet.
6. Mark your answers on the answer sheet provided. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.
7. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.
8. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.
9. The point value for each question is indicated in parentheses after the question.
10. Show all calculations, methods, or assumptions used to obtain an answer to any short answer questions.
11. Partial credit may be given except on multiple choice questions. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK.
12. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.
13. If the intent of a question is unclear, ask questions of the examiner only.

14. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.
15. Ensure all information you wish to have evaluated as part of your answer is on your answer sheet. Scrap paper will be disposed of immediately following the examination.
16. To pass the examination, you must achieve a grade of 80% or greater.
17. There is a time limit of four (4) hours for completion of the examination.
18. When you are done and have turned in your examination, leave the examination area (EXAMINER WILL DEFINE THE AREA). If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION: 001 (1.00)

WHICH of the following conditions will cause HCV-014, Radioactive Gaseous Release Control Valve, to trip shut?

- a. HI RAD ALERT on Vent Stack #2 Radiation Monitor
- b. HI RAD ALARM on Compressor Waste Gas Return Monitor 5250
- c. Isolation of RHT Vent on any HI RAD ALARM
- d. HI RAD ALARM on Aux. Bldg. Vent Duct Monitor XRE-5701

QUESTION: 002 (1.00)

Which ONE of the following statements regarding the nuclear instrument system is correct?

- a. A CHANNEL CALIBRATION may be performed on only ONE of the four nuclear instrumentation system protection channels at a time at power. The redundant protection channels not under test must be capable of performing the trip logic.
- b. An interlock between the Level Trip Bypass and Operation Selector Switches on the Intermediate and Power Range drawers requires that the Level Trip Bypass Switch be in the Bypass position before testing can be performed on the associated channel.
- c. AN ACTUATION LOGIC TEST may be performed on two of the four nuclear instrumentation system protection channels simultaneously at power. The test signals are electronically isolated from actually causing a trip.
- d. Rate Channel Test Switch on SUR Panels allows rate test or calibration of all three ranges of Nuclear Power instrumentation, however, only one channel may be in TEST at a time.

QUESTION: 003 (1.00)

Reactor power is approximately 6% and being increased per IPO-003A, "POWER OPERATIONS", when the operating Main Feed pump trips. WHICH one of the following is the expected response?

- a. All three auxiliary feed pumps auto-start on trip of both main feed pumps.
- b. The reactor trips immediately on loss of both main feed pumps.
- c. The operator starts Auxiliary Feed Pumps and manually controls steam generator levels.
- d. The operator manually trips the reactor and enters EOP-0.0, "REACTOR TRIP OR SAFETY INJECTION"

QUESTION: 004 (1.00)

WHICH ONE of the following is a possible indication of an Intermediate Range Channel being slightly undercompensated?

- a. Automatic energizing of the source range when the first intermediate range channel drops below the P-6 setpoint.
- b. Actual neutron level falls into the source range without indication.
- c. Indication remains above $10E5$ cps in the source range on both channels.
- d. Automatic energizing of the source range when the P-10 interlock was cleared on both channels.

QUESTION: 005 (1.00)

You have just completed a refueling outage on Unit 1 and are in Mode 4. A reactor trip signal is received. There are no evolutions in progress at this time. WHICH ONE of the following could have caused the trip signal?

- a. Loss of 118V INV IV1EC1 to instrument bus 1EC1
- b. Loss of 118V INV IV1PC1 to protection bus 1PC1
- c. Loss of 120V supply to INV IV1EC3 to protection bus 1EC3
- d. Loss of 480V MCC source to INV IV1PC1

QUESTION: 006 (1.00)

WHICH of the following EXCEEDS the Technical Specification Safety Limit OR DNB Limit for RCS Pressure?(assume steady-state pressure, Mode 1.)

- a. 2700 psig
- b. 2225 psig
- c. 2200 psig
- d. 2725 psig

QUESTION: 007 (1.00)

Which ONE of the following is the MINIMUM Auxiliary Feedwater (AFW) pump and SG configuration designed to remove 100% of the reactor decay heat load following a trip from 102% RTP?

- a. One turbine driven AFW pump, or two motor driven AFW pumps supplying two SG's
- b. One motor driven AFW pump supplying two SG's
- c. One turbine driven AFW pump, or two motor driven AFW pumps supplying one SG
- d. One motor driven AFW pump supplying one intact SG

QUESTION: 008 (1.00)

Starting limitations are imposed on the RHR pumps in accordance with SOP- 102A, "Residual Heat Removal System". WHICH ONE of the following limitations is correct?

- a. THREE successive starts are allowed with motor initially at cold temperature. Thereafter, an interval of FIFTEEN minutes shall elapse before any additional start
- b. ONE start is allowed with motor initially at cold temperature. Thereafter, an interval of FIVE minutes shall elapse before any additional start
- c. ONE start is allowed with motor at rated temperature. Thereafter, an interval of FIFTEEN minutes shall elapse before any additional start
- d. TWO successive starts are allowed with motor at rated temperature. Thereafter, an interval of FIVE minutes shall elapse before any additional start

QUESTION: 009 (1.00)

Given the following Unit 2 conditions:

ANNUNCIATOR ALARMS;

- PRZR PORV OUT TEMP HI
- PRZR PRESS HI
- PRZR PRESS DEV HI

DELETED PER FACILITY COMMENT

INDICATIONS;

2-PI-456, PRZR PRESS CHAN II - 2235 psig
1/2-PCPR, PRZR CTRL HTR GROUP C - OFF
2-ZL-455B, RC LOOP 4 PRZR SPR VLV - OPEN
MODE 1, NORMAL OPERATION

WHICH ONE of the following has occurred and what is the EXPECTED position of 1/2-PCV-456, PRZR PORV? (note all alarms and indications have not been given, and that only one component has failed)

- a. 2-PI-455A, PRZR PRESS CHAN I failed high, 1/2-PCV-456 is open.
- b. 2-PI-455A, PRZR PRESS CHAN I failed high, 1/2-PCV-456 is shut.
- c. 2-PI-456, PRZR PRESS CHAN II failed at 2235 psig, 1/2-PCV-456 is shut.
- d. 2-PI-456, PRZR PRESS CHAN II failed at 2235 psig, 1/2-PCV-456 is open.

QUESTION: 010 (1.00)

WHICH ONE of the following correctly describes the effects of post-transient homogeneous core voiding on Source Range Detector response? (Assume a large break LOCA with RCP's still operating)

- a. Source range level increases linearly with increasing void fraction.
- b. Source range level decreases linearly with increasing void fraction.
- c. Source range level initially decreases slowly as void fraction increases, and then decreases rapidly with high void fraction.
- d. Source range level initially increases slowly as void fraction increases, and then increases rapidly with high void fraction.

QUESTION: 011 (1.00)

WHICH ONE of the following automatic actions should NOT have occurred per ABN-304, "Main Condenser Circulating Water System Malfunction", given Mode 1 operation, and Main Condenser vacuum falls to 20" Hg?

- a. Main Turbine trip
- b. Steam dump to the condenser is not available
- c. Standby vacuum pump auto start
- d. Main Feedwater Pump turbine trip

QUESTION: 012 (1.00)

During a natural circulation cooldown (EOS-0.2A), steam generator water levels are maintained at 67 +/- 5% to:

- a. minimize uneven RCS temperature distributions.
- b. provide a stable heat sink for decay heat removal.
- c. minimize thermal transients due to cold feedwater impingement on abnormally warm U-tubes.
- d. maintain the cooldown rate at less than 35 degrees F per hour in the RCS cold legs.

QUESTION: 013 (1.00)

Which ONE of the following describes the reason for evacuation of the control room and manning of the Remote Shutdown Panel (RSP) when there is heavy smoke in the control room and fire alarms in the cable spreading room?

- a. The heavy smoke would require the use of respirators in the control room, which would affect safe operation of the plant.
- b. The heavy smoke could cause high grounds in the MCB, resulting in a shock and fire hazard, as well as equipment inoperability.
- c. The fire could damage wiring of safe shutdown equipment, rendering the equipment inoperable. Therefore, the equipment is isolated from the control room and manipulated at the RSP.
- d. The fire could damage the security access control system for the control room, which would violate security and access control requirements per Technical Specifications.

QUESTION: 014 (1.00)

WHICH ONE of the following would require manual tripping of the turbine in accordance with ABN-304, "MAIN CONDENSER AND CIRCULATING WATER SYSTEM MALFUNCTION? (Assume Mode 1, normal operations)

- a. Condenser vacuum falls below 20" Hg with 65% turbine power.
- b. Condenser vacuum dropping steadily with 45% turbine power.
- c. No circulating water pumps running with 65% turbine power.
- d. CNDSR PIT LVL TRIP/TRIP BYP Annunciator alarmed (not bypassed) with 75% turbine power.

QUESTION: 015 (1.00)

A power range channel fails high with rod control in manual. WHICH ONE of the following actions will occur?

- a. OT N16 ROD STOP & TURB RUNBACK.
- b. OP HI FLUX ROD STOP C-2.
- c. OP N16 ROD STOP & TURB RUNBACK.
- d. ANY N16 DEV HI/LO.

QUESTION: 016 (1.00)

WHICH ONE of the following statements represent the basis for ensuring letdown is isolated when performing initial operator actions of EOP-0.0A "REACTOR TRIP OR SAFETY INJECTION"?

- a. Prevents thermal shock to the regenerative heat exchanger during a loss of charging.
- b. Isolates a potential source of leakage from the RCS via the letdown relief valves.
- c. Minimizes boron concentration reduction due to the cooldown and maximum charging.
- d. Prevents a VCT overfill condition due to isolation of VCT charging suction isolation valves.

QUESTION: 017 (1.00)

WHICH of the following parameters are used to verify successful identification and isolation of the ruptured steam generator, following RCS cooldown?

- a. Ruptured steam generator pressure and RCS loop temperature.
- b. Ruptured steam generator pressure and RCS subcooling.
- c. Intact steam generator pressure and RCS loop temperature.
- d. Intact steam generator pressure and RCS subcooling.

QUESTION: 018 (1.00)

Given the following:

- Plant is increasing power from 75% to 100% power.
- All systems are in automatic.
- A boron dilution is in progress.

The Reactor Operator observes a valid "Tref - AUCT HI TAVE DEV" annunciator alarm, and no rod motion. WHICH ONE of the following is a possible cause of this alarm and the appropriate action the operator should take?

- a. Bank D rods are at 228 steps, initiate boration.
- b. Th input to Tavg failed low, select alternate temp. channel.
- c. Tc input to Tavg failed low, place rod control in manual.
- d. Control Rod Drive system urgent failure, place rod control in manual.

QUESTION: 019 (1.00)

WHICH ONE of the following groups of plant parameters are inputs for the Safety Injection Signal?

- a. RCS Pressure, Containment Pressure, RCS Temperature
- b. RCS Pressure, PZR Level, Steam Line Pressure
- c. PZR Pressure, PZR Level, RCS Temperature
- d. PZR Pressure, Containment Pressure, Steam Line Pressure

QUESTION: 020 (1.00)

WHICH ONE of the following conditions will cause Area Radiation Monitoring System "Channel in High Alarm"?

- a. Steam Generator Tube Rupture.
- b. Reactor Coolant System (RCS) to Component Cooling Water System (CCWS) leak.
- c. Gas storage tank rupture.
- d. Main steam line break.

QUESTION: 021 (1.00)

Given the following conditions:

- Loss of all offsite power
- Reactor trip
- 1EG1 & 1EG2 emergency diesel generators running and loaded
- Loss of all Digital Rod Position Indication (DRPI)
- CCP-01 & CCP-02 are running

WHICH of the following operator actions is required to ensure adequate shutdown margin for these conditions?

- a. Place the blender control switch to the Auto-After-Start position.
- b. Place the blender control switch to the Manual position.
- c. Place the blender control switch to the Borate position.
- d. Manually load the BA transfer pumps onto the bus and open emergency borate valve 1-8104.

QUESTION: 022 (1.00)

WHICH ONE of the following is the Technical Specification MINIMUM required action to be taken if a Safety Limit is violated?

- a. Notify NRC Regional Office AND be in HOT STANDBY within six hours.
- b. Notify NRC Regional Office AND be in HOT STANDBY within one hour.
- c. Notify NRC Operations Center within one hour and be in HOT STANDBY within six hours.
- d. Notify NRC Operations Center AND be in HOT STANDBY within one hour.

QUESTION: 023 (1.00)

WHICH ONE of the following individuals may authorize operation of an ISOLATION POINT during emergency conditions to protect personnel without prior approval per STA-821, "Unit Interfaces and Isolation Control Program."?

- a. Shift Supervisor.
- b. Work Control SRO.
- c. Any actively licensed operator.
- d. Any Interface Committee member.

QUESTION: 024 (1.00)

WHICH of the following describes how the Residual Heat Removal (RHR) Pumps are protected from vibration and overheating?

- a. Control valves open on a low flow condition to recirc flow from the discharge of the RHR heat exchanger to the RHR pump suction.
- b. Control valves open on a low flow condition to recirc flow from the RHR pump discharge to the RHR pump suction.
- c. Approximately 5% flow is continuously recircled from the RHR pump discharge to the RHR pump suction.
- d. Approximately 5% flow is continuously recircled from the discharge of the RHR heat exchangers to the RHR pump suction.

QUESTION: 025 (1.00)

Concerning the Station Service Water (SSW) System, which of the following is NOT a response to a safety injection signal?

- a. Standby SSW pumps starts.
- b. SSW pump recirc valves close.
- c. Traveling screens and screen wash pumps trip.
- d. SSW discharge valve from the diesel generators open.

QUESTION: 026 (1.00)

Given the following indications:

- INSTR AIR COMPR 1/2 TRIP Alarm
- INSTR AIR HDR PRESS LO Alarm
- INSTR AIR AFTFILT OUT PRESS 2-PI-3488 reads 75 psig

What are your INITIAL operator actions per ABN-301A, "INSTRUMENT AIR SYSTEM MALFUNCTION"?

- a. Verify both common instrument air compressors have auto-started.
- b. Manually start and align a common instrument air compressor.
- c. Align TPCW to instrument air compressor 1-01.
- d. Align SSW to instrument air compressor X-01.

QUESTION: 027 (1.00)

WHAT System is designed to automatically extinguish a fire in the plant computer room and how do local operators know the system is activated?

- a. Ionization detectors activate a halon system with a 60 sec delay and a local warning alarm.
- b. A fusible link activates a CO2 system with a 60 sec delay and a local warning alarm.
- c. Ionization detectors open a deluge valve in the preaction sprinkler system and simultaneously actuate a local warning alarm.
- d. A fusible link opens a flow switch in the wet pipe sprinkler system and simultaneously actuates a local warning alarm.

QUESTION: 028 (1.00)

WHICH ONE of the choices below is the reason why the Containment Purge Air Supply and Exhaust Valves are required to be locked closed during operations at power?

- a. The valves are not seismically qualified to operate during a design basis earthquake.
- b. The valve actuators do not have class 1E penetration conductor overcurrent protection devices.
- c. The related piping systems outside containment are not seismically qualified.
- d. The valves are not designed to close during a LOCA or steam line rupture accident.

QUESTION: 029 (1.00)

WHICH ONE of the following would be considered a loss of "Containment Integrity," as defined in Technical Specifications?

- a. An outer airlock door is stuck ajar (open), and the inner door is locked shut, while in MODE 2.
- b. An inner airlock door is opened and the outer door shut for 20 sec. while in MODE 1.
- c. The total leakage rate of containment penetrations exceeds Technical Specification limits while in MODE 5.
- d. Both airlock doors are simultaneously open for 45 sec during a maintenance shift change while in MODE 4.

QUESTION: 030 (1.00)

WHICH ONE of the following indications would require declaring the entry into a one-hour action statement for minimum number of "Operable Boron Injection Flow Paths" or "Borated Water Sources" in MODE 1?

- a. Both centrifugal charging pumps declared inoperable.
- b. Boron concentration in the refueling water storage tank sampled to be 21±5 ppm.
- c. One centrifugal and the positive displacement charging pump are declared inoperable.
- d. Indicated level in the refueling water storage tank reads 92%.

QUESTION: 031 (1.00)

WHICH of the following conditions would require entering a Technical Specification Action Statement in Mode 3?

- a. Opening and closing a Containment Personnel Airlock door.
- b. Electric Hydrogen Recombiners, Train "A", are inoperable.
- c. Containment Air Temperature is steady at 115 F.
- d. Containment Pressure is steady at 1.5 psig.

QUESTION: 032 (1.00)

WHICH of the following is approved with a yellow key card badge?

- a. Escorted access to protected areas only.
- b. Unescorted access to protected areas only.
- c. Escorted access to protected and selected vital areas.
- d. Unescorted access to selected vital areas.

QUESTION: 033 (1.00)

The Chemistry Department informs the control room that RCS dissolved oxygen is 10 cc/kg. This value constitutes Chemistry Remedial Action Level 2 per STA-609, "Reactor Coolant Chemistry Control Program." Action Level 2 indicates:

- a. No damage is imminent, but the Chemistry Department is required to monitor and document the trend.
- b. Long term system reliability may be affected, therefore a procedural change to improve operating practices is required.
- c. Significant damage could be done to the system thereby warranting prompt action to correct the condition.
- d. It is inadvisable to continue plant operation and a cooldown to 250 degrees F is required as soon as possible.

QUESTION: 034 (1.00)

WHICH ONE (1) of the following describes how and why Pressurizer Level is programmed?

- a. From auctioneered-high Tave because Pressurizer volume is insufficient to accommodate reactor coolant system water volume changes while limiting pressure transients.
- b. From auctioneered-high Tave because Pressurizer volume is sufficient to accommodate reactor coolant system water volume changes while limiting pressure transients.
- c. From auctioneered-high Tc because Pressurizer volume is sufficient to accommodate reactor coolant system water volume changes while limiting pressure transients.
- d. From auctioneered-high Tc because Pressurizer volume is insufficient to accommodate reactor coolant system water volume changes while limiting pressure transients.

QUESTION: 035 (1.00)

Unit 1 was operating at 100% power for several weeks. Several alarms suddenly actuated, indicating RCS pressure dropped rapidly to saturation, the reactor tripped and safety injection actuated. RCS pressure continues to drop, but much slower than initially. With the ECCS systems operating properly, WHICH of the following statements is TRUE?

- a. The CCP's supply reflood, followed immediately by the SI pumps, accumulators, then RHR pumps.
- b. The accumulators rapidly reflood the core, the CCP's and SI pumps continue injecting.
- c. The accumulators begin injecting when RCS pressure drops to 695 psig.
- d. The RHR pumps will begin injecting when RCS pressure drops to 255 psig.

QUESTION: 036 (1.00)

WHY is a Feedwater Isolation Signal generated when the RPS senses a reactor trip coincident with Lo-Lo Tave?

- a. Limit the mass addition to the containment following a SGTR and RCS depressurization.
- b. Limit S/G cooldown to minimize thermal stresses in the downcomer region.
- c. Prevent Main Feed discharge pressure from causing auxiliary feed pumps to pump at shut-off head.
- d. Limit RCS cooldown to minimize positive reactivity added and maintain shutdown margin.

QUESTION: 037 (1.00)

WHICH of the following is an immediate indication in the control room of a steam supply isolation to one of the MSR's at full turbine load?

- a. Reactor power increase due to a slight cooldown and negative temperature coefficient feedback.
- b. Reactor power decrease due to a slight heatup and negative temperature coefficient feedback.
- c. The MSR Separator Drain Tank alternate drain valve cycles open to dump water back to the condenser.
- d. The MSR Separator Drain Tank alternate drain valve cycles shut due to low level in the drain tank.

QUESTION: 038 (1.00)

WHICH ONE of the following is the ALTERNATE power supply to the UNIT 2 class 1E 6.9kv buses?

- a. 345 kv startup transformer XST2.
- b. 138 kv startup transformer XST1.
- c. Unit 2 Emergency Diesel Generators.
- d. 345 kv startup transformer 2ST.

QUESTION: 039 (1.00)

WHICH ONE of the following describes the automatic actions that take place in the AC distribution system on a loss of preferred power to a class 1E safeguards bus? (Assume the normal supply breaker trips open and alternate power is normal.)

- a. If fast transfer fails, Diesel Generator starts and loads on dead bus within 10 seconds.
- b. If slow transfer fails, Diesel Generator starts and loads on dead bus within 10 seconds.
- c. Fast transfer to alternate power supply; if fails, a slow transfer to alternate power supply.
- d. Slow transfer to alternate power supply; if fails, a fast transfer to emergency power supply.

QUESTION: 040 (1.00)

WHICH ONE of the following supplies power for field flashing of the "A" Train Emergency Diesel Generator?

- a. 125vdc station batteries BT1ED1 AND BT1ED2
- b. 125vdc station batteries BT1ED1 AND BT1ED3
- c. DC control power from 1EDC BUS 1D1
- d. DC control power from 1EDC BUS 1D2

QUESTION: 041 (1.00)

WHICH ONE of the following describes the method for marking and ensuring that a procedure used in the field is the current revision?

- a. The procedure is stamped "CONTROLLED" and must initially be verified current.
- b. The procedure is stamped "FOR INFORMATION ONLY" and is verified current to the controlled copy every 24 hours.
- c. The procedure is stamped "SAFEGUARDS INFORMATION" and is verified current to the working copy every 24 hours.
- d. The procedure is stamped "WORKING COPY" and must initially be verified current.

QUESTION: 042 (1.00)

Unit 1 has been shut down for a refueling outage. While performing an independent verification for the Containment Spray System, you find that valve 1CT-0016, CS PMP1-04 DISCH TO EDUCT ISOL VLV, is closed. The valve is out of position (Expected position is OPEN). Which one of the following describes the actions to be taken for this situation?

- a. Immediately reposition the valve, then inform the Unit Supervisor and complete a ONE form.
- b. Inform the Unit Supervisor but do NOT reposition the valve until permission is granted by the Unit Supervisor.
- c. Immediately reposition the valve and log the "as found" and "as left" conditions in the "Comment" section.
- d. Log the valve position in the "Comments" section and continue with the next valve; do NOT reposition the valve.

QUESTION: 043 (1.00)

If pressurizer level falls below the LOW setpoint (17%), which one of the following describes the actuations that result from this signal?

- a. CVCS letdown isolation valves LCV-459 & 460 close and letdown heat exchanger pressure control valve PCV-131 opens.
- b. CVCS letdown isolation valves LCV-459 & 460 close and letdown orifice isolation valve(s) [8149A,B,C] close.
- c. CVCS letdown containment isolation valves 8152 & 8160 close and letdown orifice isolation valve(s) [8149A,B,C] close.
- d. CVCS letdown containment isolation valves 8152 & 8160 close and letdown heat exchanger pressure control valve PCV-131 opens.

QUESTION: 044 (1.00)

Which one of the following describes the consequences of resetting an automatic Safety Injection signal?

- a. The ECCS pumps that were auto started by the SI sequencer will return to the stopped condition.
- b. Any ECCS pumps subsequently stopped after SI reset will get SI sequencer start signal ONLY if a manual SI signal is generated.
- c. A subsequent Blackout signal will sequence on ONLY the running ECCS pumps.
- d. A subsequent Blackout signal will automatically sequence on ALL the ECCS pumps.

QUESTION: 045 (1.00)

Which one of following describes the response of the Liquid Radwaste System to a "HIGH" alarm on X-RE-5253, the Liquid Waste discharge process radiation monitor?

- a. Waste Monitor Tank Pumps trip.
- b. Laundry and Hot Shower Tank Pump trips.
- c. RCDT to RHT containment isolation valves auto-close.
- d. Liquid waste discharge isolation valve auto-closes.

QUESTION: 046 (1.00)

Which one of the following lists the inputs to the Subcooled Margin Monitor (SMM)?

- a. RCS loop pressures; Pressurizer temperature; Pressurizer pressure; average CET temperature.
- b. RCS loop RTD temperatures; RCS loop pressures; Pressurizer pressure; highest CET temperature.
- c. Pressurizer temperature; Pressurizer pressure; highest CET temperature.
- d. RCS loop RTD temperatures; RCS loop pressures; average CET temperature.

QUESTION: 047 (1.00)

During a Containment Spray System actuation, a low level condition in the Chemical Additive Tank is sensed by both Train A and B. If the Train A Chemical Additive Tank motor operated discharge valve (HV-4754) fails to close, which of the following actions will occur?

- a. The Chemical Additive Tank air operated discharge valve (HV-4753) will close on low-low Chemical Additive Tank level.
- b. The Chemical Additive Tank motor operated discharge valve (HV-4753) will close on low Chemical Additive Tank level.
- c. CSP 1 and CSP 3 will trip on low-low Chemical Additive Tank level.
- d. CSP 1 and CSP 3 will trip on low suction pressure.

QUESTION: 048 (1.00)

The following Unit 1 conditions exist:

- MODE 5, with RCS at 190 degrees F and 350 psig.
- "B" Diesel Generator output breaker is tagged out for preventive maintenance on the breaker.
- All other required systems are OPERABLE.

WHICH ONE of the following describes a condition that would place the unit in a Technical Specification ACTION?

- a. Non-Class 1E 125 V Bus 1D3 is de-energized.
- b. 24/48 V switchboard 1D1 is de-energized.
- c. 125 V 1E station batteries BT1ED1 and BT1ED2 are inoperable.
- d. Train "B" 125 V 1E bus 1ED2 is de-energized.

QUESTION: 049 (1.00)

WHICH ONE of the following describes the effect on DG operation when the starting air system (which has been tagged out) is restored (clearance removed)?

- a. The pneumatic control system returned the DG to NORMAL mode when the air pressure was regained.
- b. The "normal" DG trips are blocked since continuous control air pressure is required to maintain these trips active.
- c. The governor control switched to MANUAL when the control air pressure dropped below 60 psig and must be manually reset.
- d. The fuel valves failed to the full open position due to loss of position air to the mechanical governor and must be manually reset.

QUESTION: 050 (1.00)

A reactor startup is in progress with the reactor subcritical and Control Bank C at 20 steps when a rod from Shutdown Bank E drops. In this situation:

- a. the reactor must be tripped.
- b. all control banks must be inserted to CBO.
- c. an emergency boration must be commenced.
- d. all control and shutdown banks must be inserted to CBO.

QUESTION: 051 (1.00)

Which one of the following indications/parameters is symptomatic of a small primary loop LOCA, but NOT symptomatic of a main steamline rupture inside containment?

- a. Decreasing RCS subcooling.
- b. Rising containment recirc sump levels.
- c. Decreasing RCS loop temperatures.
- d. Increasing containment pressure.

QUESTION: 052 (1.00)

Which one of the following is the temperature which would be read on the pressurizer PORV temperature indicator if a pressurizer PORV were leaking? (Assume an ideal thermodynamic process, a pressurizer pressure of 2185 psig, and a PRT pressure of 5 psig.)

- a. 360 degrees F
- b. 230 degrees F
- c. 190 degrees F
- d. 170 degrees F

QUESTION: 053 (1.00)

WHICH of the following describes a feature of Unit 2 D5 Steam Generators?

- a. Inconel tube support plates for improved corrosion resistance.
- b. Quatrefoil holes in the tube support plate.
- c. Narrow range level tap below the transition cone.
- d. Increased number of U-tubes over D4 for larger heat transfer area.

QUESTION: 054 (1.00)

WHICH of the following describes the UNIT 2 difference in Steam Generator water level setpoints from Unit 1 and the reason for those differences?

"The Unit 2 LOW LOW LVL REACTOR TRIP SETPOINT is _____ and the HI HI LVL P-14 TURBINE TRIP SETPOINT is _____ .

- a. higher, higher.
- b. higher, lower.
- c. lower, higher.
- d. lower, lower.

QUESTION: 055 (1.00)

While conducting an initial valve lineup on UNIT 2 CCW, you discover that a small vent isolation valve is on a different elevation/location than in UNIT 1, and the location is not in accordance with the lineup sheet. This is determined to be a minor procedural discrepancy.

WHAT action(s) should you take?

- a. Complete the lineup, initiate a Technical Evaluation (TE) per STA-820, "Reporting and Evaluating Unit Differences."
- b. Complete the lineup, initiate a procedure/form change form per STA-205, "Changes to Procedures."
- c. Terminate the lineup, then initiate a procedure/form change form per STA-205, "Changes to Procedures."
- d. Terminate the lineup, initiate a Technical Evaluation (TE) per STA-820, "Reporting and Evaluating Unit Differences", and initiate a procedure/form change form per STA-205, "Changes to Procedures."

QUESTION: 056 (1.00)

WHICH of the following correctly describes the difference in OT-N16 trip setpoint and the DNBR (Departure from Nucleate Boiling Ratio) design limit from Unit 2 to Unit 1?

- a. Both the setpoint and the DNBR limit are lower on Unit 2.
- b. Both the setpoint and the DNBR limit are higher on Unit 2.
- c. Unit 2 has a higher setpoint and a lower DNBR limit.
- d. Unit 2 has a lower setpoint and a higher DNBR limit.

QUESTION: 057 (1.00)

WHICH of the following signals will auto start both the motor and turbine driven Auxiliary Feedwater Pumps?

- a. 2 of 4 Low Low Levels in 1 of 4 steam generators.
- b. Trip of both Main Feedwater Pumps.
- c. SI signal.
- d. Blackout sequence signal.

QUESTION: 058 (1.00)

A leak has developed from the Unit 2 CCW Surge Tank, and you have just received a "CCW SRG TK TRN A/B EMPTY" alarm. WHICH of the following will occur (immediately following the alarm) if the leak was on side "A" and the A CCW pump was the operating pump, with the "B" CCW pump in standby?

- a. CCW flow to the RCP'S is lost.
- b. The A CCW pump trips and the B CCW pump starts.
- c. The B side safeguard loop isolation valves close.
- d. Makeup from the reactor makeup water system initiates.

QUESTION: 059 (1.00)

In reference to IPO-003, "POWER OPERATIONS", a condition for operating at steady turbine loads states "Rods should be maintained in automatic when operating at a constant load."

WHY are control rods routinely operated in manual when at high power in Unit 1?

- a. The potential for inadvertent outward rod motion due to instrument failure at high power is greater than the original safety analysis and can cause OTN-16 trip.
- b. Vortexing in the upper plenum results in the OTN-16 anomaly which causes spurious rod motion in automatic; undesirable at high power due to large flux oscillations.
- c. Standing Orders require manual operation of the control rods above 95% power to minimize flux oscillations due to rod motion in response to small temperature variations at high power.
- d. Historical operating experience has found a degradation of rod control reliability at higher power when in automatic mode of control.

QUESTION: 060 (1.00)

Unit 2 is in MODE 1, with reactor thermal power slowly increasing above 101%, when a turbine runback occurs. The runback stops abruptly and power stops increasing. The reactor operator reports the runback, then another runback starts and stops. Reactor thermal power is now 100% and decreasing.

WHICH of the following has likely occurred?

- a. Heater Drain Pump discharge pressure switch is spuriously indicating 0 flow, causing two short runbacks.
- b. A Main Feedwater Pump has tripped, but the "b" contact in the trip logic circuit has failed, initiating two short runbacks.
- c. TSE calculated Temperature Margins are less than the allowable minimum, reducing the speed gradient and initiating two spurious runbacks.
- d. The OTN-16 less 3% limit was exceeded twice, initiating an equivalent 10%/min runback.

QUESTION: 061 (1.00)

In accordance with STA-694, "Station Verification Activities", which one of the following conditions would allow independent verification to be waived?

- a. A clearance installs a grounding strap on a non-safety related 480V breaker.
- b. The valve verification requires entry into containment in MODE 5.
- c. The valve verification would likely result in radiation exposure of greater than 25 mrem.
- d. The valve verification requires entry into a high radiation area.

QUESTION: 062 (1.00)

A 120V breaker has the following clearance tags attached to the breaker switch:

- A Caution Tag
- A Test-in-Progress Tag

An auxiliary operator is performing a routine surveillance and finds that it requires him to cycle this 120V breaker. WHICH ONE of the following describes how the operator can complete this step of his surveillance?

- a. The operator can operate the breaker without restriction.
- b. The operator can operate the breaker as instructed by the information on the Caution Tag, with concurrence of the individual(s) performing the test requiring the Test-In-Progress Tag.
- c. The operator can operate the breaker within the limits of the information on the Caution Tag.
- d. The operator cannot operate the breaker until the Test-in-Progress Tag is removed.

QUESTION: 063 (1.00)

Which one of the following situations would require specific ALARA job planning as detailed in STA-657 "ALARA Job Planning/Debriefing"?

	TASK	TIME	DOSE RATE
a.	2 persons replacing a valve gasket;	1 hr.	450 mrem/hr.
b.	2 persons removing a piping spool piece;	2 hr.	200 mrem/hr.
c.	3 persons performing a surveillance test on a HVAC filter unit;	2 hr.	50 mrem/hr.
d.	4 people performing pump maintenance;	5 hr.	50 mrem/hr.

QUESTION: 064 (1.00)

WHICH one of the following is required to sign for approval on a Confined Space Entry Permit per STA-628 "Confined Space Entry"?

- a. Manager, Work Control
- b. TU Electric Safety Supervisor
- c. Safety Services Manager
- d. Work Group Supervisor

QUESTION: 065 (1.00)

WHICH ONE of the following correctly describes the number of personnel and qualifications required regarding the content of the Fire Brigade in accordance with STA-727, "Fire Brigade?"

- a. One fire brigade leader, fully qualified as auxiliary operator, three auxiliary operators as hosemen and two plant personnel as nozzlemen.
- b. One fire brigade leader, fully qualified in all plant safety systems, two auxiliary operators as nozzlemen and three plant personnel as hosemen.
- c. One fire brigade leader, fully qualified as auxiliary operator, two auxiliary operators as nozzlemen and two plant personnel as hosemen.
- d. One fire brigade leader, fully qualified in all plant safety systems, two auxiliary operators as hosemen and two plant personnel as nozzlemen.

QUESTION: 066 (1.00)

While REFUELING the reactor operator notices that the audible count rate has suddenly gone quiet. WHICH of the following is an INITIAL OPERATOR ACTION in accordance with ARW-701, "SOURCE RANGE INSTRUMENT MALFUNCTION"?

- a. Ensure at least one operable SR Channel prior to continuing with CORE ALTERATIONS
- b. Commence emergency borating until cause is known and corrected or RCS boron concentration has increased by 100ppm
- c. Set the channel selector switch on the audio count rate channel drawer to the unaffected source range channel
- d. Secure any CORE ALTERATIONS in progress and ensure both SR Channels are operable prior to any positive reactivity additions

QUESTION: 067 (1.00)

You have completed main turbine synchronization per IPO-003A, "POWER OPERATIONS" and are increasing power when you receive the following indications:

- HP TURB CSG DELTA T HI annunciator
- Report of high delta T indication at HP CASING FRONT T/B reading +85 F.
- Reactor power is 6%, Turbine power is 3%

WHICH of the following actions should you take per ABN-401, "MAIN TURBINE MALFUNCTION"?

- a. Trip the Reactor and go to EOP-0.0, "REACTOR TRIP OR SAFETY INJECTION".
- b. Trip the turbine and go to ABN-403, "TURBINE TRIP RESPONSE".
- c. Rapidly reduce turbine load while monitoring temperatures and trip turbine if temperature continues increasing.
- d. Verify and close extraction steam line drain valves.

QUESTION: 068 (1.00)

WHICH ONE of the following would require the associated Emergency Diesel Generator to be declared INOPERABLE?

- a. One starting air receiver ruptures and is incapable of maintaining pressure. The other receiver is normal.
- b. Both air compressors run continuously due to faulty pressure switches and are caution tagged off. "Start when receiver pressure drops to less than 200 psig then secure at 250 psig."
- c. Both starting air receiver relief valves have become partially clogged. One relieves at 140 psig and the other at 145 psig
- d. One air compressor is mechanically bound and unrepairable. The other functions normally.

QUESTION: 069 (1.00)

With dual unit technical specifications, what convention has been established to denote that an LCO and associated ACTION statements are applicable to BOTH UNITS?

- a. next to APPLICABILITY: "Unit 1 and 2"
- b. next to ACTION: "Unit 1 and 2"
- c. all are assumed applicable to BOTH UNITS unless otherwise noted.
- d. next to COMMANCHE PEAK - UNIT 1 AND 2 at lower left bottom of page.

QUESTION: 070 (1.00)

WHICH of the following requires Plant Manager's approval for exceeding overtime limitations per STA-615, "Staff Work Hours"?

- a. Two Turbine Bldg. Aux. Operators work 5 days on 12 hour shifts; then continue on normal 8 hour shifts with a third operator.
- b. A licensed Reactor Operator extends his shift to 10 hours due to car problems of his relief.
- c. A Chemistry Technician works 14 hours straight due to unusual secondary chemistry conditions.
- d. The Manager, Operations, works 17 hours one day to catch up on a backlog of paperwork.

QUESTION: 071 (1.00)

Following an inadvertent reactor trip and ESF actuation due to improper testing, whose permission is required, per ODA-108, "Post RPS/ESF Actuation Evaluation", to conduct mode changes to a higher mode given the following:

- All required reports are completed and evaluated.
 - Cause is known and corrected.
 - All automatic equipment operated correctly.
 - Technical Specification compliance is verified.
 - Dayshift. All required management personnel available.
- a. Manager, Operations
 - b. Plant Manager
 - c. Station Operations Review Committee
 - d. Vice President, Nuclear Operations

QUESTION: 072 (1.00)

During dual unit operations with Unit 1 at 65% power and Unit 2 at 100%, the Shift Supervisor declares an ALERT due to an abnormal condition on Unit 1. He then promptly faints and is unable to carry out his duties.

WHICH of the following shall assume the role of Emergency Coordinator?

- a. The Operations Advisor.
- b. The Unit 1 Supervisor.
- c. The Shift Technical Advisor.
- d. The Unit 2 Supervisor.

QUESTION: 073 (1.00)

During dual unit operations with Unit 1 at 85% and Unit 2 at 100%, a 25 gallon per minute leak develops in the boric acid storage tank (BAT-X01). The decision is made to declare the tank inoperable, drain and repair. The BAT-X02 tank is filled to 100% by transferring the drained contents of the BAT-X01 tank.

WHICH of the following statements is CORRECT immediately after filling BAT-X02?

- a. Restore the BAT-X01 to operable within 72 hrs. or be in hot standby within the next 6 hrs.
- b. Restore the BAT-X01 to operable within 1 hr. or be in hot standby within the next 6 hrs.
- c. If Unit 2 must conduct operations that reduce the inventory of the BAT-X02, BOTH units must be in hot standby in the next 6 hrs.
- d. BOTH units may continue operations and are not entered into an LCO action at this time.

QUESTION: 074 (1.00)

To what value must steam generator pressure be adjusted in order to maintain a 200 degree F subcooling margin in the RCS, when RCS pressure is reduced to 1600 psig? (Assume ideal heat transfer conditions)

- a. 235 psig
- b. 250 psig
- c. 285 psig
- d. 320 psig

QUESTION: 075 (1.00)

While conducting a cooldown in accordance with EOS-0.2A, "Natural Circulation Cooldown", you have reached step 13 and are initiating RCS depressurization. WHAT is the procedural method of depressurizing the RCS for the given conditions?

- a. If letdown is in service, use one PRZR PORV.
- b. If letdown is in service, use auxiliary spray.
- c. If auxiliary spray is not available, use CRDM fans and ambient cooling.
- d. If a PRZR PORV is not available, use CRDM fans and ambient cooling.

QUESTION: 076 (1.00)

When inadequate core cooling exists, what is the proper sequence of and major actions/processes to be performed in accordance with FRC-0.1a, "RESPONSE TO INADEQUATE CORE COOLING", for removing decay heat from the core?

- a. Reinitiation of high pressure safety injection; RCP restart; rapid secondary depressurization
- b. Rapid secondary depressurization; reinitiation of high pressure safety injection; RCP restart
- c. RCP restart; reinitiation of high pressure safety injection; rapid secondary depressurization
- d. Reinitiation of high pressure safety injection; rapid secondary depressurization; RCP restart

QUESTION: 077 (1.00)

Which one of the following is the correct time/condition for entering EOS-1.4A, "Transfer to Hot Leg Recirculation", following a LOCA on Unit 1?

- a. 16 hours after the LOCA initiated.
- b. When cold leg recirculation flow is lost.
- c. 24 hours after cold leg recirculation is established.
- d. When RWST level reaches the low level alarm.

QUESTION: 078 (1.00)

WHICH ONE of the following determines the temperature at which RCS cooldown following a steam generator tube rupture is TERMINATED per EOP-3.0A, "Steam Generator Tube Rupture"?

- a. Intact steam generator temperature.
- b. Temperature at which RHR can be placed in service.
- c. Ruptured steam generator pressure.
- d. 50 deg F RCS subcooling by core exit thermocouples.

QUESTION: 079 (1.00)

A reactor startup is in progress with the reactor critical. The Reactor Operator has just finished logging the following readings:

-	N-31	3 X E +4 cpm
-	N-32	5 X E +4 cpm
-	N-35	5 X E -11 amps
-	N-36	4 X E -11 amps
-	N-41 thru N44	0% power
-	SUR IS	.5 DPM

After taking the readings, several annunciators actuate in the control room, one of which is "SR FLUX DBLG." WHICH of the following ACTIONS should be taken?

- Trip the reactor.
- Manually insert all control rods.
- Proceed with the startup after blocking both Source Range Instruments, N-31 & N-32.
- Proceed with the startup but restore failed SR Channel to operable status before exceeding 10% power.

QUESTION: 080 (1.00)

WHICH ONE of the choices below would result in continuous out rod motion with rod control in automatic? (Assume the input is selected for control if selection is required.)

- Turbine impulse pressure fails high
- An N-16 channel fails high
- An NI power channel fails high
- A loop T-cold channel fails high

QUESTION: 081 (1.00)

Given the following conditions:

- A large break LOCA occurred early in your shift
- Actions required by EOP-0.0A, "Reactor Trip Or Safety Injection" are completed
- Actions required by EOP-1.0A, "Loss Of Reactor Or Secondary Coolant" are complete up to verifying power available to open hot leg recirc required valves.
- All ECCS systems are operating normally
- RCS pressure is stable at 200 psig

Which of the following statements correctly describes the PRIMARY METHOD of decay heat removal?

- a. Condensation of reflux boiling in the SGs.
- b. Natural circulation cooling of the RCS by the SGs.
- c. Injection of water from the RWST to the hot legs while water/steam flows out from the break.
- d. Injection of water from the containment sump to the cold legs while water/steam flows out from the break.

QUESTION: 082 (1.00)

Unit 1 is in Mode 6 preparing for refueling and Unit 2 is Mode 4. WHICH ONE of the following is the minimum shift manning requirements for both units? (Do not assume additional qualifications that would allow exceptions to the manning requirements)

	SS	US	RO	AO	STA
	--	--	--	--	---
a.	1	2	3	8	1
b.	1	2	4	7	1
c.	None	2	4	10	1
d.	1	1	2	3	None

QUESTION: 083 (1.00)

Which one of the following is the MINIMUM emergency declaration that requires the Emergency Coordinator to dismiss appropriate non-TU Electric engineering and construction personnel from the site?

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

QUESTION: 084 (1.00)

Unit 1 has lost off-site power and is maintaining MODE 3 steady-state conditions. WHICH ONE of the following would indicate that natural circulation flow has developed in the RCS?

- a. RCS subcooling is reading 20 degrees F.
- b. SG pressures are slowly increasing above 1130 psig.
- c. Core exit thermocouple temp. have decreased to 560 degrees F
- d. RCS hot leg temperatures have increased to 620 degrees F.

QUESTION: 085 (1.00)

The unit is at 100% equilibrium power (constant Tavg) with all systems in automatic. Pressurizer level is being maintained at program by the PDP with balanced letdown and charging. VCT level is remaining constant at 50%. RCP seal injection flow to all RCPS is 32 gpm and total #1 seal leakoff is 12 gpm.

IF letdown flow indicates 75 gpm on FT-132, WHICH one of the following would be the indicated total charging flow on FT-121?

- a. 107 gpm
- b. 87 gpm
- c. 75 gpm
- d. 63 gpm

QUESTION: 086 (1.00)

In accordance with ABN-102A "High Reactor Coolant Activity" following a CRIM "burst", with specific activity exceeding 100/E uCi/gm, the RCS must be taken to MODE 3 and cooled down to less than 500 degrees F within 6 hours.

WHICH ONE of the following is the reason/basis for cooling down below 500 degrees F?

- a. Minimize thermal stress on the fuel cladding.
- b. Increase the solubility of the corrosion products in the coolant.
- c. Prevent lifting the SG relief valves in the event of a SGTR.
- d. Limit containment radiation levels in the event of a LOCA.

QUESTION: 087 (1.00)

WHICH ONE of the following provides input to the Rod Insertion Limit Monitor for reactor power?

- a. Auctioneered high Tave
- b. Auctioneered high Tref
- c. Auctioneered high N-16 power
- d. Auctioneered high delta T

QUESTION: 088 (1.00)

WHICH ONE of the following rod speeds would be signaled by an automatic rod insertion where Tavg is greater than Tref by four (4) degrees F?

- a. 8 steps per minute
- b. 35 steps per minute
- c. 40 steps per minute
- d. 72 steps per minute

QUESTION: 089 (1.00)

WHICH ONE of the following conditions will cause an Urgent Failure in the Rod Control System Logic Cabinet?

- a. Loose printed circuit card
- b. Multiplex error
- c. 16.5V DC power supply failure
- d. "Auxiliary" 120V AC power failure

QUESTION: 090 (1.00)

WHICH ONE of the following would require the IMMEDIATE trip of the affected Reactor Coolant Pump?

- a. Motor frame (case) vibration of 6 mils
- b. No. 1 seal differential pressure of 205 psid
- c. Shaft vibration of 16 mils
- d. No. 1 seal inlet temperature of 215 degrees F

QUESTION: 091 (1.00)

The following plant conditions exist:

- Unit 1 is in Mode 2 at 3% power.
- Tav_g indication is 550 degrees F.

WHICH ONE of the following actions is the MINIMUM necessary to comply with Technical Specification 3.1.1.4, "Minimum Temperature For Criticality"?

- a. Restore Tav_g to greater than 561 degrees within 15 minutes or be in HOT STANDBY within the next 15 minutes.
- b. Restore Tav_g to greater than 551 degrees within 15 minutes or be in HOT STANDBY within the next 15 minutes.
- c. Restore Tav_g to greater than 561 degrees within 15 minutes or be in HOT STANDBY within the next 30 minutes.
- d. Restore Tav_g to greater than 551 degrees within 15 minutes or be in HOT STANDBY within the next 30 minutes.

QUESTION: 092 (1.00)

WHICH ONE of the following actions is required if, after a reactor trip, TWO control rods are NOT fully inserted and a THIRD has no digital rod position indication on the DRPI panel, per EOP-0.0A "REACTOR TRIP OR SAFETY INJECTION"?

- a. Emergency borate 2360 gallons of boric acid.
- b. Emergency borate 1180 gallons of boric acid and 1180 additional gallons due to loss of indication on one rod.
- c. Emergency borate 3540 gallons of boric acid.
- d. Emergency borate 1180 gallons of boric acid.

QUESTION: 093 (1.00)

A leak in WHICH ONE of the following heat exchangers would cause a dilution of the RCS?

- a. RCP thermal barrier heat exchanger
- b. Seal water return heat exchanger
- c. Letdown heat exchanger
- d. Primary sample cooler

QUESTION: 094 (1.00)

Given the following conditions:

- Reactor power 38%
- Pressurizer pressure is 1985 psig and decreasing at 1 psig/min.
- One Pressurizer spray valve indicates open; controller in auto and demand position is zero.

WHICH ONE of the following actions MUST be performed by the operators per ABN-705, "Pressurizer Pressure Malfunction"?

- a. Trip the Reactor, then trip the associated RCP.
- b. Trip the associated RCP; if pressure continues decreasing then initiate Safety Injection.
- c. Attempt to manually close the spray valve; if pressure continues decreasing then trip the associated RCP.
- d. Attempt to manually close the spray valve; if pressure continues decreasing then manually initiate Safety Injection.

QUESTION: 095 (1.00)

WHICH ONE of the following is the minimum hydrogen concentration which requires engineering support personnel analysis prior to Hydrogen Recombiner operation?

- a. minimum detectable.
- b. 0.5%
- c. 6.0%
- d. 18.0%

QUESTION: 096 (1.00)

Unit 1 is operating at 100% power when a toxic gas (carbon dioxide) forces the evacuation of the Control Room. In accordance with ABN-905A "Loss of Control Room Habitability", the Shift Supervisor orders a Reactor Trip.

WHICH ONE of the following should be performed PRIOR to leaving the Control Room?

- a. Perform a closure of MSIV's and secure main feed.
- b. Deenergize both Rod Drive Motor-Generator sets by taking the motor and generator control switch handles to PULL-OUT.
- c. Verify turbine trip and shift charging pump suction to RWST.
- d. Verify auxiliary feed actuation and activate the Control Room Evacuation Alarm.

QUESTION: 097 (1.00)

WHICH ONE of the following actions is required if the main turbine does not trip automatically following a reactor trip and cannot be tripped from the MCB, per EOP-0.0 "Reactor Trip or Safety Injection"?

- a. Trip the Local Trip Valve at the Hydraulic Control Rack.
- b. Secure the condenser vacuum pumps and break condenser vacuum.
- c. Manually RUNBACK the turbine at maximum rate.
- d. Open the main generator output breakers.

QUESTION: 098 (1.00)

If the RCPs were lost due to a loss of offsite power, WHICH one of the following is an indication of the establishment of natural circulation, per ECA-0.1A "LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED"?

- a. RCS subcooling greater than 20 degrees F.
- b. RCS Tc stable or increasing.
- c. RCS Th stable or decreasing.
- d. S/G pressure stable or increasing.

QUESTION: 099 (1.00)

WHICH ONE of the following describes the initial response THEN final condition of RCS Tavg and PRZR Press. respectively, given the following conditions?

- 250 Effective Full Power Days (EFPD) in this core cycle
- 85% Reactor Power for last 35 days
- Rod Control in MANUAL
- All other control systems in AUTOMATIC

The control room operators conduct a boration at the maximum rate to increase RCS boron concentration by 10ppm. Assume no other operator action.

- a. Both increase THEN Both return to their initial values.
- b. Both decrease THEN Both return to their initial values.
- c. Both decrease THEN only Tavg returns to its' initial value.
- d. Both decrease THEN only PRZR Press. returns to its' initial value.

QUESTION: 100 (1.00)

WHICH ONE of the following conditions REQUIRES that every effort be made to provide double valve isolation per STA-605 "CLEARANCE AND SAFETY TAGGING"? (Assume NO Unit 1/Unit 2 INTERFACE equipment involved)

- a. When the fluid system is potentially contaminated above minimum detectable activity.
- b. When the fluid system is extremely caustic.
- c. When the fluid system is pressurized greater than 400 psig OR at a temperature greater than 185 F.
- d. When the fluid system is being hydrostatically tested.

(***** END OF EXAMINATION *****)

ANSWER KEY

MULTIPLE CHOICE

001 d

002 a

003 c

004 b

005 b

006 c

007 b

008 c

~~009 b~~ DELETED PER FACILITY COMMENT

010 d

011 b

012 b

013 c

014 b

015 b

016 b

017 b

018 d

019 d

020 c

021 d

022 d

023 a

024 a

025 b

026 b

027 a

028 d

029 d

030 d

031 d

032 b

033 c

034 a

035 b

036 d

037 b

038 a

039 b

040 b

041 d

042 b

043 b

044 b

045 d

ANSWER KEY

046	b	069	b
047	a	070	a
048	c	071	b
049	a	072	d
050	b	073	d
051	a	074	b
052	b	075	b
053	b	076	d
054	b	077	a
055	b	078	c
056	b	079	c
057	d	080	a
058	a	081	d
059	b	082	b
060	d	083	b
061	c	084	c
062	b	085	b
063	d	086	c
064	d	087	c
065	c	088	c
066	d	089	a
067	b	090	a
068	c	091	b

ANSWER KEY

092 c

093 b

094 c

095 ~~a~~ [✓]c (KEY INCORRECT, CORRECT ANSWER "C")

096 c

097 a

098 ~~b~~ [✓]c (KEY INCORRECT, CORRECT ANSWER "C")

099 d

100 d

(***** END OF EXAMINATION *****)

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 SITE SPECIFIC EXAMINATION
 REACTOR OPERATOR LICENSE
 REGION 4

CANDIDATE'S NAME: _____
 FACILITY: Comanche Peak 1
 REACTOR TYPE: PWR-WEC4
 DATE ADMINISTERED: 92/06/22

INSTRUCTIONS TO CANDIDATE:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

<u>TEST VALUE</u>	<u>CANDIDATE'S SCORE</u>	<u>%</u>	
99.00			
100.00			
	<u>FINAL GRADE</u>	<u>%</u>	TOTALS

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

 Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.
2. After the examination has been completed, you must sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination. This must be done after you complete the examination.
3. Restroom trips are to be limited and only one applicant at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.
4. Use black ink or dark pencil ONLY to facilitate legible reproductions.
5. Print your name in the blank provided in the upper right-hand corner of the examination cover sheet and each answer sheet.
6. Mark your answers on the answer sheet provided. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.
7. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.
8. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.
9. The point value for each question is indicated in parentheses after the question.
10. Show all calculations, methods, or assumptions used to obtain an answer to any short answer questions.
11. Partial credit may be given except on multiple choice questions. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK.
12. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.
13. If the intent of a question is unclear, ask questions of the examiner only.

14. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.
15. Ensure all information you wish to have evaluated as part of your answer is on your answer sheet. Scrap paper will be disposed of immediately following the examination.
16. To pass the examination, you must achieve a grade of 80% or greater.
17. There is a time limit of four (4) hours for completion of the examination.
18. When you are done and have turned in your examination, leave the examination area (EXAMINER WILL DEFINE THE AREA). If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION: 001 (1.00)

WHICH of the following groups of permissives ALL receive an input from the summer output of each excore power range nuclear instrument?

- a. P-6, P-9, P-11
- b. P-4, P-7, P-10
- c. P-6, P-8, P-10
- d. P-7, P-8, P-9

QUESTION: 002 (1.00)

During a reactor startup, just prior to reaching criticality, the SUR meter indication will respond to a given amount of rod withdrawal by...

- a. Rising slowly, then slowly falling off to zero
- b. Rising rapidly, then slowly falling off to zero
- c. Rising slowly, then rapidly falling off to zero
- d. Rising rapidly, then rapidly falling off to zero

QUESTION: 003 (1.00)

Which ONE of the following statements regarding the nuclear instrument system is correct?

- a. A CHANNEL CALIBRATION may be performed on only ONE of the four nuclear instrumentation system protection channels at a time at power. The redundant protection channels not under test must be capable of performing the trip logic.
- b. An interlock between the Level Trip Bypass and Operation Selector Switches on the Intermediate and Power Range drawers requires that the Level Trip Bypass Switch be in the Bypass position before testing can be performed on the associated channel.
- c. AN ACTUATION LOGIC TEST may be performed on two of the four nuclear instrumentation system protection channels simultaneously at power. The test signals are electronically isolated from actually causing a trip.
- d. Rate Channel Test Switch on SUR Panels allows rate test or calibration of all three ranges of Nuclear Power instrumentation, however, only one channel may be in TEST at a time.

QUESTION: 004 (1.00)

Reactor power is approximately 6% and being increased per IPO-003A, "POWER OPERATIONS", when the operating Main Feed pump trips. WHICH one of the following is the expected response?

- a. All three auxiliary feed pumps auto-start on trip of both main feed pumps.
- b. The reactor trips immediately on loss of both main feed pumps.
- c. The operator starts Auxiliary Feed Pumps and manually controls steam generator levels.
- d. The operator manually trips the reactor and enters EOP-0.0, "REACTOR TRIP OR SAFETY INJECTION"

QUESTION: 005 (1.00)

You have just completed a refueling outage on Unit 1 and are in Mode 4. A reactor trip signal is received. There are no evolutions in progress at this time. WHICH ONE of the following could have caused the trip signal?

- a. Loss of 118V INV IV1EC1 to instrument bus 1EC1
- b. Loss of 118V INV IV1PC1 to protection bus 1PC1
- c. Loss of 120V supply to INV IV1EC3 to protection bus 1EC3
- d. Loss of 480V MCC source to INV IV1PC1

QUESTION: 006 (1.00)

WHICH of the following EXCEEDS the Technical Specification Safety Limit OR DNB Limit for RCS Pressure?(assume steady-state pressure, Mode 1.)

- a. 2700 psig
- b. 2225 psig
- c. 2200 psig
- d. 2725 psig

QUESTION: 007 (1.00)

Which ONE of the following is the MINIMUM Auxiliary Feedwater (AFW) pump and SG configuration designed to remove 100% of the reactor decay heat load following a trip from 102% RTP?

- a. One turbine driven AFW pump, or two motor driven AFW pumps supplying two SG's
- b. One motor driven AFW pump supplying two SG's
- c. One turbine driven AFW pump, or two motor driven AFW pumps supplying one SG
- d. One motor driven AFW pump supplying one intact SG

QUESTION: 008 (1.00)

Starting limitations are imposed on the RHR pumps in accordance with SOP- 102A, "Residual Heat Removal System". WHICH ONE of the following limitations is correct?

- a. THREE successive starts are allowed with motor initially at cold temperature. Thereafter, an interval of FIFTEEN minutes shall elapse before any additional start
- b. ONE start is allowed with motor initially at cold temperature. Thereafter, an interval of FIVE minutes shall elapse before any additional start
- c. ONE start is allowed with motor at rated temperature. Thereafter, an interval of FIFTEEN minutes shall elapse before any additional start
- d. TWO successive starts are allowed with motor at rated temperature. Thereafter, an interval of FIVE minutes shall elapse before any additional start

QUESTION: 009 (1.00)

Which ONE of the following statements describes the effects of rapidly reintroducing feedwater into a "DRY" Steam Generator?

- a. Steam binding in steam generator piping preventing any additional feed flow.
- b. Excessive thermal stress causing possible tube leak or rupture.
- c. Inability to regulate feed rate resulting in uncertainty in actual steam generator level.
- d. Excessive pressure stress, resulting in possible steam line break.

QUESTION: 010 (1.00)

Given the following Unit 2 conditions:

ANNUNCIATOR ALARMS:

- PRZR PORV OUT TEMP HI
- PRZR PRESS HI
- PRZR PRESS DEV HI

DELETED PER FACILITY COMMENTS

INDICATIONS:

2-PI-456 PRZR PRESS CHAN II - 2235 psig
1/2-PCV-456, PRZR CTRL WTR GROUP C - OFF
2-ZL-455B, RC LOOP 4 PRZR SPR VLV - OPEN
MODE 1, NORMAL OPERATION

WHICH ONE of the following has occurred and what is the EXPECTED position of 1/2-PCV-456, PRZR PORV? (note all alarms and indications have not been given, and that only one component has failed)

- a. 2-PI-455A, PRZR PRESS CHAN I failed high, 1/2-PCV-456 is open.
- b. 2-PI-455A, PRZR PRESS CHAN I failed high, 1/2-PCV-456 is shut.
- c. 2-PI-456, PRZR PRESS CHAN II failed at 2235 psig, 1/2-PCV-456 is shut.
- d. 2-PI-456, PRZR PRESS CHAN II failed at 2235 psig, 1/2-PCV-456 is open.

QUESTION: 011 (1.00)

Which one of the following items is NOT a potential result during a continuous rod withdrawal?

- a. Overpower rod stop
- b. Reactor power - turbine power mismatch
- c. Rod control urgent failure
- d. Tavg deviation

QUESTION: 012 (1.00)

WHICH ONE of the following correctly describes the effects of post-transient homogeneous core voiding on Source Range Detector response? (Assume a large break LOCA with RCP's still operating)

- a. Source range level increases linearly with increasing void fraction.
- b. Source range level decreases linearly with increasing void fraction.
- c. Source range level initially decreases slowly as void fraction increases, and then decreases rapidly with high void fraction.
- d. Source range level initially increases slowly as void fraction increases, and then increases rapidly with high void fraction.

QUESTION: 013 (1.00)

WHICH ONE of the following automatic actions should NOT have occurred per ABN-304, "Main Condenser Circulating Water System Malfunction", given Mode 1 operation, and Main Condenser vacuum falls to 20" Hg?

- a. Main Turbine trip
- b. Steam dump to the condenser is not available
- c. Standby vacuum pump auto start
- d. Main Feedwater Pump turbine trip

QUESTION: 014 (1.00)

During a natural circulation cooldown (EOS-0.2A), steam generator water levels are maintained at 67 +/- 5% to:

- a. minimize uneven RCS temperature distributions
- b. provide a stable heat sink for decay heat removal.
- c. minimize thermal transients due to cold feedwater impingement on abnormally warm U-tubes.
- d. maintain the cooldown rate at less than 35 degrees F per hour in the RCS cold legs.

QUESTION: 015 (1.00)

Which ONE of the following describes the reason for evacuation of the control room and manning of the Remote Shutdown Panel (RSP) when there is heavy smoke in the control room and fire alarms in the cable spreading room?

- a. The heavy smoke would require the use of respirators in the control room, which would affect safe operation of the plant.
- b. The heavy smoke could cause high grounds in the MCB, resulting in a shock and fire hazard, as well as equipment inoperability.
- c. The fire could damage wiring of safe shutdown equipment, rendering the equipment inoperable. Therefore, the equipment is isolated from the control room and manipulated at the RSP.
- d. The fire could damage the security access control system for the control room, which would violate security and access control requirements per Technical Specifications.

QUESTION: 016 (1.00)

WHICH ONE of the following would require manual tripping of the turbine in accordance with ABN-304, "MAIN CONDENSER AND CIRCULATING WATER SYSTEM MALFUNCTION? (Assume Mode 1, normal operations)

- a. Condenser vacuum falls below 20" Hg with 65% turbine power.
- b. Condenser vacuum dropping steadily with 45% turbine power.
- c. No circulating water pumps running with 65% turbine power.
- d. CNDSR PIT LVL TRIP/TRIP BYP Annunciator alarmed (not bypassed) with 75% turbine power.

QUESTION: 017 (1.00)

According to ABN-902, "Accidental Release Of Radioactive Gas", WHICH of the following "HIGH RADIATION" alarms will close X-HCV-0014, GWPS DISCH TO PLT EXH PLUM ISOL VLV?

- a. Containment Particulate
- b. Containment Gaseous
- c. Control Room Duct Monitor
- d. Auxiliary Building Vent Duct Monitor

QUESTION: 018 (1.00)

During a Unit 2 startup, WHICH ONE of the following BEST describes the reason for resetting both MFP turbines prior to starting the first MFP?

- a. Ensure HP and LP stop valves remain open for both turbines.
- b. Prevent delay when transitioning to the second MFP during startup.
- c. Prevent spurious actuation of the Auxiliary Feed Actuation Signal.
- d. Prevent spurious actuation of the Feed Water Isolation Signal.

QUESTION: 019 (1.00)

A power range channel fails high with rod control in manual. WHICH ONE of the following actions will occur?

- a. OT N16 ROD STOP & TURB RUNBACK.
- b. OP HI FLUX ROD STOP C-2.
- c. OP N16 ROD STOP & TURB RUNBACK.
- d. ANY N16 DEV HI/LO.

QUESTION: 020 (1.00)

PT-455F is the ONLY RCS Pressure transmitter which provides input to:

- a. post accident monitoring instrumentation.
- b. cold overpressure protection circuit for PORV PCV-455A.
- c. normal overpressure protection circuit for PORV PCV-455A.
- d. remote shutdown monitoring instrumentation.

QUESTION: 021 (1.00)

WHICH ONE of the following statements represent the basis for ensuring letdown is isolated when performing initial operator actions of EOP-0.0A "REACTOR TRIP OR SAFETY INJECTION"?

- a. Prevents thermal shock to the regenerative heat exchanger during a loss of charging.
- b. Isolates a potential source of leakage from the RCS via the letdown relief valves.
- c. Minimizes boron concentration reduction due to the cooldown and maximum charging.
- d. Prevents a VCT overfill condition due to isolation of VCT charging suction isolation valves.

QUESTION: 022 (1.00)

WHICH of the following parameters are used to verify successful identification and isolation of the ruptured steam generator, following RCS cooldown?

- a. Ruptured steam generator pressure and RCS loop temperature.
- b. Ruptured steam generator pressure and RCS subcooling.
- c. Intact steam generator pressure and RCS loop temperature.
- d. Intact steam generator pressure and RCS subcooling.

QUESTION: 023 (1.00)

Given the following:

- Plant is increasing power from 75% to 100% power.
- All systems are in automatic.
- A boron dilution is in progress.

The Reactor Operator observes a valid "Tref - AUCT HI TAVE DEV" annunciator alarm, and no rod motion. WHICH ONE of the following is a possible cause of this alarm and the appropriate action the operator should take?

- a. Bank D rods are at 228 steps, initiate boration.
- b. Th input to Tavg failed low, select alternate temp. channel.
- c. Tc input to Tavg failed low, place rod control in manual.
- d. Control Rod Drive system urgent failure, place rod control in manual.

QUESTION: 024 (1.00)

WHICH of the following describes how the Residual Heat Removal (RHR) Pumps are protected from vibration and overheating?

- a. Control valves open on a low flow condition to recirc flow from the discharge of the RHR heat exchanger to the RHR pump suction.
- b. Control valves open on a low flow condition to recirc flow from the RHR pump discharge to the RHR pump suction.
- c. Approximately 5% flow is continuously recircled from the RHR pump discharge to the RHR pump suction.
- d. Approximately 5% flow is continuously recircled from the discharge of the RHR heat exchangers to the RHR pump suction.

QUESTION: 025 (1.00)

A safety injection signal is actuated at 100% Power. WHICH ONE of the following is expected to occur?

- a. CVCS letdown and normal spray will be unavailable, and the alternate charging valve will open.
- b. CVCS letdown will be unavailable, PD charging pump trips and RCP seal injection flow is maximized.
- c. Normal and auxiliary spray will be unavailable, and the alternate charging valve will close.
- d. CCW flow to RCP thermal barriers is lost, RCP seal injection flow is maximized, and the alternate charging valve will close.

QUESTION: 026 (1.00)

Concerning the Station Service Water (SSW) System, which of the following is NOT a response to a safety injection signal?

- a. Standby SSW pumps starts.
- b. SSW pump recirc valves close.
- c. Traveling screens and screen wash pumps trip.
- d. SSW discharge valve from the diesel generators open.

QUESTION: 027 (1.00)

Unit 1 is operating at 100% power when SSWP1 trips. WHICH ONE of the following is an initial operator action per ABN-501, "Station Service Water Malfunction".

- a. Attempt to restart the SSWP1
- b. Verify CCWP1 is running.
- c. Stop CCWP1, if running.
- d. Verify SSWP2 is running.

QUESTION: 028 (1.00)

Given the following indications:

- INSTR AIR COMPR 1/2 TRIP Alarm
- INSTR AIR HDR PRESS LO Alarm
- INSTR AIR AFTFILT OUT PRESS 2-PI-3488 reads 75 psig

What are your INITIAL operator actions per ABN-301A, "INSTRUMENT AIR SYSTEM MALFUNCTION"?

- a. Verify both common instrument air compressors have auto-started.
- b. Manually start and align a common instrument air compressor.
- c. Align TPCW to instrument air compressor 1-01.
- d. Align SSW to instrument air compressor X-01.

QUESTION: 029 (1.00)

WHAT System is designed to automatically extinguish a fire in the plant computer room and how do local operators know the system is activated?

- a. Ionization detectors activate a halon system with a 60 sec delay and a local warning alarm.
- b. A fusible link activates a CO2 system with a 60 sec delay and a local warning alarm.
- c. Ionization detectors open a deluge valve in the preaction sprinkler system and simultaneously actuate a local warning alarm.
- d. A fusible link opens a flow switch in the wet pipe sprinkler system and simultaneously actuates a local warning alarm.

QUESTION: 030 (1.00)

WHICH ONE of the choices below is the reason why the Containment Purge Air Supply and Exhaust Valves are required to be locked closed during operations at power?

- a. The valves are not seismically qualified to operate during a design basis earthquake.
- b. The valve actuators do not have class 1E penetration conductor overcurrent protection devices.
- c. The related piping systems outside containment are not seismically qualified.
- d. The valves are not designed to close during a LOCA or steam line rupture accident.

QUESTION: 031 (1.00)

WHICH ONE of the following would be considered a loss of "Containment Integrity," as defined in Technical Specifications?

- a. An outer airlock door is stuck ajar (open), and the inner door is locked shut, while in MODE 2.
- b. An inner airlock door is opened and the outer door shut for 20 sec. while in MODE 1.
- c. The total leakage rate of containment penetrations exceeds Technical Specification limits while in MODE 5.
- d. Both airlock doors are simultaneously open for 45 sec during a maintenance shift change while in MODE 4.

QUESTION: 032 (1.00)

WHICH of the following Control Board Air Operated valves fails in the CLOSED position on a loss of instrument air pressure?

- a. CCWP 2 RECIRC VLV 1-HS-4537
- b. LTDN HX CCW RET VLV 1-ZL-4646
- c. RCP 1 SEAL 1 LKOFF VLV 1/1-8141A
- d. FWP A RECIRC FLO CTRL 1/FK-2289

QUESTION: 033 (1.00)

WHICH ONE of the following indications would require declaring the entry into a one-hour action statement for minimum number of "Operable Boron Injection Flow Paths" or "Borated Water Sources" in MODE 1?

- a. Both centrifugal charging pumps declared inoperable.
- b. Boron concentration in the refueling water storage tank sampled to be 2155 ppm.
- c. One centrifugal and the positive displacement charging pump are declared inoperable.
- d. Indicated level in the refueling water storage tank reads 92%.

QUESTION: 034 (1.00)

"ANY RCP SEAL WTR INJ FLO LO" alarm is received while operating at 100% power. The reactor operator verifies that the #2 RCP seal water injection flow is pegged low. WHICH ONE of the following is the correct INITIAL operator action given these indications?

- a. Immediately shut the #2 RCP seal #1 leakoff valve.
- b. Trip the reactor then trip the #2 RCP.
- c. Verify proper seal injection flow to the other RCP's.
- d. Verify proper CCW flow to #2 RCP thermal barrier.

QUESTION: 035 (1.00)

WHICH of the following conditions would require entering a Technical Specification Action Statement in Mode 3?

- a. Opening and closing a Containment Personnel Airlock door.
- b. Electric Hydrogen Recombiners, Train "A", are inoperable.
- c. Containment Air Temperature is steady at 115 F.
- d. Containment Pressure is steady at 1.5 psig.

QUESTION: 036 (1.00)

WHICH one of the following would alert the operator to the UNDERCOMPENSATION of one Intermediate Range Channel?

- a. P-6 energizes much sooner than expected following a reactor trip.
- b. P-6 energizes much sooner than expected during a reactor startup.
- c. P-6 does not energize following a reactor trip.
- d. P-6 does not energize during a reactor startup.

QUESTION: 037 (1.00)

WHICH of the following is approved with a yellow key card badge?

- a. Escorted access to protected areas only.
- b. Unescorted access to protected areas only.
- c. Escorted access to protected and selected vital areas.
- d. Unescorted access to selected vital areas.

QUESTION: 038 (1.00)

The Chemistry Department informs the control room that RCS dissolved oxygen is 10 cc/kg. This value constitutes Chemistry Remedial Action Level 2 per STA-609, "Reactor Coolant Chemistry Control Program." Action Level 2 indicates:

- a. No damage is imminent, but the Chemistry Department is required to monitor and document the trend.
- b. Long term system reliability may be affected, therefore a procedural change to improve operating practices is required.
- c. Significant damage could be done to the system thereby warranting prompt action to correct the condition.
- d. It is inadvisable to continue plant operation and a cooldown to 250 degrees F is required as soon as possible.

QUESTION: 039 (1.00)

WHICH ONE (1) of the following describes how and why Pressurizer Level is programmed?

- a. From auctioneered-high Tave because Pressurizer volume is insufficient to accommodate reactor coolant system water volume changes while limiting pressure transients.
- b. From auctioneered-high Tave because Pressurizer volume is sufficient to accommodate reactor coolant system water volume changes while limiting pressure transients.
- c. From auctioneered-high Tc because Pressurizer volume is sufficient to accommodate reactor coolant system water volume changes while limiting pressure transients.
- d. From auctioneered-high Tc because Pressurizer volume is insufficient to accommodate reactor coolant system water volume changes while limiting pressure transients.

QUESTION: 040 (1.00)

Unit 1 was operating at 100% power for several weeks. Several alarms suddenly actuated, indicating RCS pressure dropped rapidly to saturation, the reactor tripped and safety injection actuated. RCS pressure continues to drop, but much slower than initially. With the ECCS systems operating properly, WHICH of the following statements is TRUE?

- a. The CCP's supply reflood, followed immediately by the SI pumps, accumulators, then RHR pumps.
- b. The accumulators rapidly reflood the core, the CCP's and SI pumps continue injecting.
- c. The accumulators begin injecting when RCS pressure drops to 695 psig.
- d. The RHR pumps will begin injecting when RCS pressure drops to 255 psig.

QUESTION: 041 (1.00)

WHICH ONE of the following RPS reactor trips provides protection from departure from nucleate boiling?

- a. Pressurizer Level High.
- b. Power Range High Flux (high setpoint).
- c. Pressurizer High Pressure.
- d. Power Range High Flux (low setpoint).

QUESTION: 042 (1.00)

WHY is a Feedwater Isolation Signal generated when the RPS senses a reactor trip coincident with Lo-Lo Tave?

- a. Limit the mass addition to the containment following a SGTR and RCS depressurization.
- b. Limit S/G cooldown to minimize thermal stresses in the downcomer region.
- c. Prevent Main Feed discharge pressure from causing auxiliary feed pumps to pump at shut-off head.
- d. Limit RCS cooldown to minimize positive reactivity added and maintain shutdown margin.

QUESTION: 043 (1.00)

WHICH of the following is an immediate indication in the control room of a steam supply isolation to one of the MSR's at full turbine load?

- a. Reactor power increase due to a slight cooldown and negative temperature coefficient feedback.
- b. Reactor power decrease due to a slight k_{eff} drop and negative temperature coefficient feedback.
- c. The MSR Separator Drain Tank alternate drain valve cycles open to dump water back to the condenser.
- d. The MSR Separator Drain Tank alternate drain valve cycles shut due to low level in the drain tank.

QUESTION: 044 (1.00)

WHICH ONE of the following is the ALTERNATE power supply to the UNIT 2 class 1E 6.9kv buses?

- a. 345 kv startup transformer XST2.
- b. 138 kv startup transformer XST1.
- c. Unit 2 Emergency Diesel Generators.
- d. 345 kv startup transformer 2ST.

QUESTION: 045 (1.00)

WHICH ONE of the following describes the automatic actions that take place in the AC distribution system on a loss of preferred power to a class 1E safeguards bus? (Assume the normal supply breaker trips open and alternate power is normal.)

- a. If fast transfer fails, Diesel Generator starts and loads on dead bus within 10 seconds.
- b. If slow transfer fails, Diesel Generator starts and loads on dead bus within 10 seconds.
- c. Fast transfer to alternate power supply; if fails, a slow transfer to alternate power supply.
- d. Slow transfer to alternate power supply; if fails, a fast transfer to emergency power supply.

QUESTION: 046 (1.00)

WHICH ONE of the following supplies power for field flashing of the "A" Train Emergency Diesel Generator?

- a. 125vdc station batteries BT1ED1 AND BT1ED2
- b. 125vdc station batteries BT1ED1 AND BT1ED3
- c. DC control power from 1EDC BUS 1D1
- d. DC control power from 1EDC BUS 1D2

QUESTION: 047 (1.00)

WHICH ONE of the following describes the method for marking and ensuring that a procedure used in the field is the current revision?

- a. The procedure is stamped "CONTROLLED" and must initially be verified current.
- b. The procedure is stamped "FOR INFORMATION ONLY" and is verified current to the controlled copy every 24 hours.
- c. The procedure is stamped "SAFEGUARDS INFORMATION" and is verified current to the working copy every 24 hours.
- d. The procedure is stamped "WORKING COPY" and must initially be verified current.

QUESTION: 048 (1.00)

Unit 1 has been shut down for a refueling outage. While performing an independent verification for the Containment System, you find that valve 1CT-0016, CS PMP1-04 DISCH TO ED. is closed. The valve is out of position (Expected position is open). Which one of the following describes the actions to be taken for this situation?

- a. Immediately reposition the valve, then inform the Unit Supervisor and complete a ONE form.
- b. Inform the Unit Supervisor but do NOT reposition the valve until permission is granted by the Unit Supervisor.
- c. Immediately reposition the valve and log the "as found" and "as left" conditions in the "Comment" section.
- d. Log the valve position in the "Comments" section and continue with the next valve; do NOT reposition the valve.

QUESTION: 049 (1.00)

Which one of the following describes a problem of safety significance concerning operation with a misaligned control rod (LOWER than associated group) over a long period of time?

- a. For continued operation, peak local power densities may be exceeded when the rod is withdrawn.
- b. Following a reactor trip, the critical rod height will be higher than the ECC since the affected rod was lower than actual bank position used in calculating ECC.
- c. For continued operation, RCS temperature limits may be exceeded since the average temperature must be raised to compensate for the misaligned rod.
- d. Following a reactor trip, the total xenon concentration may be lower than if the rod was at its normal position.

QUESTION: 050 (1.00)

If pressurizer level falls below the LCW setpoint (17%), which one of the following describes the actuations that result from this signal?

- a. CVCS letdown isolation valves LCV-459 & 460 close and letdown heat exchanger pressure control valve PCV-131 opens.
- b. CVCS letdown isolation valves LCV-459 & 460 close and letdown orifice isolation valve(s) [8149A,B,C] close.
- c. CVCS letdown containment isolation valves 8152 & 8160 close and letdown orifice isolation valve(s) [8149A,B,C] close.
- d. CVCS letdown containment isolation valves 8152 & 8160 close and letdown heat exchanger pressure control valve PCV-131 opens.

QUESTION: 051 (1.00)

Which one of the following describes the consequences of resetting an automatic Safety Injection signal?

- a. The ECCS pumps that were auto started by the SI sequencer will return to the stopped condition.
- b. Any ECCS pumps subsequently stopped after SI reset will get SI sequencer start signal ONLY if a manual SI signal is generated.
- c. A subsequent Blackout signal will sequence on ONLY the running ECCS pumps.
- d. A subsequent Blackout signal will automatically sequence on ALL the ECCS pumps.

QUESTION: 052 (1.00)

Which one of following describes the response of the Liquid Radwaste System to a "HIGH" alarm on X-RE-5253, the Liquid Waste discharge process radiation monitor?

- a. Waste Monitor Tank Pumps trip.
- b. Laundry and Hot Shower Tank Pump trips.
- c. RCDT to RHT containment isolation valves auto-close.
- d. Liquid waste discharge isolation valve auto-closes.

QUESTION: 053 (1.00)

Which one of the following lists the inputs to the Subcooled Margin Monitor (SMM)?

- a. RCS loop pressures; Pressurizer temperature; Pressurizer pressure; average CET temperature.
- b. RCS loop RTD temperatures; RCS loop pressures; Pressurizer pressure; highest CET temperature.
- c. Pressurizer temperature; Pressurizer pressure; highest CET temperature.
- d. RCS loop RTD temperatures; RCS loop pressures; average CET temperature.

QUESTION: 054 (1.00)

Which one of the following lists the portions of the Rod Position Indication (RPI) and Rod Insertion Limit (RIL) systems that utilize the pulse signal generated by the slave cyclers in the rod control system?

- a. Digital Rod Position Indication and Rod Insertion Limit Calculator.
- b. Bank Demand Position Indication and Pulse To Analog Converter.
- c. Bank Demand Position Indication and Digital Rod Position Indication.
- d. Digital Rod Position Indication and Pulse To Analog Converter.

QUESTION: 055 (1.00)

During a Containment Spray System actuation, a low level condition in the Chemical Additive Tank is sensed by both Train A and B. If the Train A Chemical Additive Tank motor operated discharge valve (HV-4754) fails to close, which of the following actions will occur?

- a. The Chemical Additive Tank air operated discharge valve (HV-4753) will close on low-low Chemical Additive Tank level.
- b. The Chemical Additive Tank motor operated discharge valve (HV-4753) will close on low Chemical Additive Tank level.
- c. CSP 1 and CSP 3 will trip on low-low Chemical Additive Tank level.
- d. CSP 1 and CSP 3 will trip on low suction pressure.

QUESTION: 056 (1.00)

The following Unit 1 conditions exist:

- MODE 5, with RCS at 190 degrees F and 350 psig.
- "B" Diesel Generator output breaker is tagged out for preventive maintenance on the breaker.
- All other required systems are OPERABLE.

WHICH ONE of the following describes a condition that would place the unit in a Technical Specification ACTION?

- a. Non-Class 1E 125 V Bus 1D3 is de-energized.
- b. 24/48 V switchboard 1D1 is de-energized.
- c. 125 V 1E station batteries BT1ED1 and BT1ED2 are inoperable.
- d. Train "B" 125 V 1E bus 1ED2 is de-energized.

QUESTION: 057 (1.00)

WHICH ONE of the following describes the effect on DG operation when the starting air system (which has been tagged out) is restored (clearance removed)?

- a. The pneumatic control system returned the DG to NORMAL mode when the air pressure was regained.
- b. The "normal" DG trips are blocked since continuous control air pressure is required to maintain these trips active.
- c. The governor control switched to MANUAL when the control air pressure dropped below 60 psig and must be manually reset.
- d. The fuel valves failed to the full open position due to loss of position air to the mechanical governor and must be manually reset.

QUESTION: 058 (1.00)

A reactor startup is in progress with the reactor subcritical and Control Bank C at 20 steps when a rod from Shutdown Bank E drops. In this situation:

- a. the reactor must be tripped.
- b. all control banks must be inserted to CBO.
- c. an emergency boration must be commenced.
- d. all control and shutdown banks must be inserted to CBO.

QUESTION: 059 (1.00)

Which one of the following indications/parameters is symptomatic of a small primary loop LOCA, but NOT symptomatic of a main steamline rupture inside containment?

- a. Decreasing RCS subcooling.
- b. Rising containment recirc sump levels.
- c. Decreasing RCS loop temperatures.
- d. Increasing containment pressure.

QUESTION: 060 (1.00)

Which one of the following is the temperature which would be read on the pressurizer PORV temperature indicator if a pressurizer PORV were leaking? (Assume an ideal thermodynamic process, a pressurizer pressure of 2185 psig, and a PRT pressure of 5 psig.)

- a. 360 degrees F
- b. 230 degrees F
- c. 190 degrees F
- d. 170 degrees F

QUESTION: 061 (1.00)

WHICH of the following describes a feature of Unit 2 D5 Steam Generators?

- a. Inconel tube support plates for improved corrosion resistance.
- b. Quatrefoil holes in the tube support plate.
- c. Narrow range level tap below the transition cone.
- d. Increased number of U-tubes over D4 for larger heat transfer area.

QUESTION: 062 (1.00)

During refueling operations, WHICH ONE of the following observations would confirm to an operator that he was inside Unit 2?

- a. The fuel is oriented with the reference hole in the southeast corner.
- b. The bridge motion warning buzzer momentarily silences every 2 sec. for .5 sec.
- c. The reactor vessel internals storage stand 180 degree axis is toward the north.
- d. The refueling machine and RCCF are right handed.

QUESTION: 063 (1.00)

WHICH of the following describes the UNIT 2 difference in Steam Generator water level setpoints from Unit 1 and the reason for those differences?

"The Unit 2 LOW LOW LVL REACTOR TRIP SETPOINT is _____ and the HI HI LVL P-14 TURBINE TRIP SETPOINT is _____ .

- a. higher, higher.
- b. higher, lower.
- c. lower, higher.
- d. lower, lower.

QUESTION: 064 (1.00)

While conducting an initial valve lineup on UNIT 2 CCW, you discover that a small vent isolation valve is on a different elevation/location than in UNIT 1, and the location is not in accordance with the lineup sheet. This is determined to be a minor procedural discrepancy.

WHAT action(s) should you take?

- a. Complete the lineup, initiate a Technical Evaluation (TE) per STA-820, "Reporting and Evaluating Unit Differences."
- b. Complete the lineup, initiate a procedure/form change form per STA-205, "Changes to Procedures."
- c. Terminate the lineup, then initiate a procedure/form change form per STA-205, "Changes to Procedures."
- d. Terminate the lineup, initiate a Technical Evaluation (TE) per STA-820, "Reporting and Evaluating Unit Differences", and initiate a procedure/form change form per STA-205, "Changes to Procedures."

QUESTION: 065 (1.00)

WHICH of the following correctly describes the difference in OT-N16 trip setpoint and the DNBR (Departure from Nucleate Boiling Ratio) design limit from Unit 2 to Unit 1?

- a. Both the setpoint and the DNBR limit are lower on Unit 2
- b. Both the setpoint and the DNBR limit are higher on Unit 2.
- c. Unit 2 has a higher setpoint and a lower DNBR limit.
- d. Unit 2 has a lower setpoint and a higher DNBR limit.

QUESTION: 066 (1.00)

HOW is the UNIT 1 CVCS charging pump suction piping protected from overpressure?

- a. A single relief valve is installed downstream of the VCT outlet isolation valves, LCV-112B and LCV-112C.
- b. Three relief valves are installed in the charging pump suction piping.
- c. A single relief valve is installed in the SI pump suction piping, cross connected to the charging pump suction.
- d. A single relief valve is installed in the suction piping of the RHR pumps, cross connected to the charging pump suction.

QUESTION: 067 (1.00)

WHICH of the following signals will auto start both the motor and turbine driven Auxiliary Feedwater Pumps?

- a. 2 of 4 Low Low Levels in 1 of 4 steam generators.
- b. Trip of both Main Feedwater Pumps.
- c. SI signal.
- d. Blackout sequence signal.

QUESTION: 068 (1.00)

A leak has developed from the Unit 2 CCW Surge Tank, and you have just received a "CCW SRG TK TRN A/B EMPTY" alarm. WHICH of the following will occur (immediately following the alarm) if the leak was on side "A" and the A CCW pump was the operating pump, with the "B" CCW pump in standby?

- a. CCW flow to the RCP'S is lost.
- b. The A CCW pump trips and the B CCW pump starts.
- c. The B side safeguard loop isolation valves close.
- d. Makeup from the reactor makeup water system initiates.

QUESTION: 069 (1.00)

During dual unit operation, a steam line rupture occurs inside Unit 1 containment, with pressure reaching 4.5 psig. Given that the break occurred at 100% power and all automatic systems operated properly, WHAT is the expected status of the Containment Air Cooling and Recirculation System (CACRS)?

- a. CACRS fans shift to slow speed and dampers realign to the emergency mode.
- b. CACRS fans shift to fast speed and SSW is aligned to the four cooling units.
- c. The CACRS is unaffected and continues operating as before the steam line break.
- d. CACRS fans trip and Ventillation Chilled Water is isolated from the four cooling units.

QUESTION: 070 (1.00)

In reference to IPO-003, "POWER OPERATIONS", a condition for operating at steady turbine loads states "Rods should be maintained in automatic when operating at a constant load."

WHY are control rods routinely operated in manual when at high power in Unit 1?

- a. The potential for inadvertent outward rod motion due to instrument failure at high power is greater than the original safety analysis and can cause OTN-16 trip.
- b. Vortexing in the upper plenum results in the OTN-16 anomaly which causes spurious rod motion in automatic; undesirable at high power due to large flux oscillations.
- c. Standing Orders require manual operation of the control rods above 95% power to minimize flux oscillations due to rod motion in response to small temperature variations at high power.
- d. Historical operating experience has found a degradation of rod control reliability at higher power when in automatic mode of control.

QUESTION: 071 (1.00)

Unit 2 is in MODE 1, with reactor thermal power slowly increasing above 101%, when a turbine runback occurs. The runback stops abruptly and power stops increasing. The reactor operator reports the runback, then another runback starts and stops. Reactor thermal power is now 100% and decreasing.

WHICH of the following has likely occurred?

- a. Heater Drain Pump discharge pressure switch is spuriously indicating 0 flow, causing two short runbacks.
- b. A Main Feedwater Pump has tripped, but the "b" contact in the trip logic circuit has failed, initiating two short runbacks.
- c. TSE calculated Temperature Margins are less than the allowable minimum, reducing the speed gradient and initiating two spurious runbacks.
- d. The OTN-16 less 3% limit was exceeded twice, initiating an equivalent 10%/min runback.

QUESTION: 072 (1.00)

In accordance with STA-694, "Station Verification Activities", which one of the following conditions would allow independent verification to be waived?

- a. A clearance installs a grounding strap on a non-safety related 480V breaker.
- b. The valve verification requires entry into containment in MODE 5.
- c. The valve verification would likely result in radiation exposure of greater than 25 mrem.
- d. The valve verification requires entry into a high radiation area.

QUESTION: 073 (1.00)

A 120V breaker has the following clearance tags attached to the breaker switch:

- A Caution Tag
- A Test-in-Progress Tag

An auxiliary operator is performing a routine surveillance and finds that it requires him to cycle this 120V breaker. WHICH ONE of the following describes how the operator can complete this step of his surveillance?

- a. The operator can operate the breaker without restriction.
- b. The operator can operate the breaker as instructed by the information on the Caution Tag, with concurrence of the individual(s) performing the test requiring the Test-In-Progress Tag.
- c. The operator can operate the breaker within the limits of the information on the Caution Tag.
- d. The operator cannot operate the breaker until the Test-in-Progress Tag is removed.

QUESTION: 074 (1.00)

WHICH one of the following is required to sign for approval on a Confined Space Entry Permit per STA-628 "Confined Space Entry"?

- a. Manager, Work Control
- b. TU Electric Safety Supervisor
- c. Safety Services Manager
- d. Work Group Supervisor

QUESTION: 075 (1.00)

WHICH ONE of the following correctly describes the number of personnel and qualifications required regarding the content of the Fire Brigade in accordance with STA-727, "Fire Brigade?"

- a. One fire brigade leader, fully qualified as auxiliary operator, three auxiliary operators as hosemen and two plant personnel as nozzlemen.
- b. One fire brigade leader, fully qualified in all plant safety systems, two auxiliary operators as nozzlemen and three plant personnel as hosemen.
- c. One fire brigade leader, fully qualified as auxiliary operator, two auxiliary operators as nozzlemen and two plant personnel as hosemen.
- d. One fire brigade leader, fully qualified in all plant safety systems, two auxiliary operators as hosemen and two plant personnel as nozzlemen.

QUESTION: 076 (1.00)

While REFUELING the reactor operator notices that the audible count rate has suddenly gone quiet. WHICH of the following is an INITIAL OPERATOR ACTION in accordance with ABN-701, "SOURCE RANGE INSTRUMENT MALFUNCTION"?

- a. Ensure at least one operable SR Channel prior to continuing with CORE ALTERATIONS
- b. Commence emergency borating until cause is known and corrected or RCS boron concentration has increased by 100ppm
- c. Set the channel selector switch on the audio count rate channel drawer to the unaffected source range channel
- d. Secure any CORE ALTERATIONS in progress and ensure both SR Channels are operable prior to any positive reactivity additions

QUESTION: 077 (1.00)

The plant is operating at 100% when a break in the charging line occurs just downstream of FV-121 (CCP Flow Control Valve). The operator shuts down the running CCP and does not start another charging pump. Which one of the following is true?

- a. RCS water from the RCP seals will reverse flow back to the break at FV-121 and continue to leak until seal injection isolation valves are closed
- b. Without seal injection, RCS water will flow up through the # 1 seal, overheating the seal package and leading to loss of # 1 seal within 1 minute if seal injection is not restored
- c. Seal leakoff isolation valves must be isolated within 5 minutes and the RCPs shutdown within the next 30 minutes
- d. RCP seals will perform normally as long as the thermal barrier is available to remove heat from the RCS water that is flowing up through the seals

QUESTION: 078 (1.00)

WHICH ONE of the following conditions will cause an Urgent Failure in the Rod Control System Logic Cabinet?

- a. Loose printed circuit card
- b. Multiplex error
- c. 16.5V DC power supply failure
- d. "Auxiliary" 120V AC power failure

QUESTION: 079 (1.00)

WHICH ONE of the following rod speeds would be signaled by an automatic rod insertion where T_{avg} is greater than T_{ref} by four (4) degrees F?

- a. 8 steps per minute
- b. 35 steps per minute
- c. 40 steps per minute
- d. 72 steps per minute

QUESTION: 080 (1.00)

WHICH ONE of the following would require the IMMEDIATE trip of the affected Reactor Coolant Pump?

- a. Motor frame (case) vibration of 6 mils
- b. No. 1 seal differential pressure of 205 psid
- c. Shaft vibration of 16 mils
- d. No. 1 seal inlet temperature of 215 degrees F

QUESTION: 081 (1.00)

WHICH ONE of the following conditions exceeds the precautions/limitations for Reactor Coolant Pump (RCP) operation per SOP-108A, "Reactor Coolant Pump"?

- a. During a RCP start for RCS fill/venting operations, number 1 seal dp reads 300 psid.
- b. During a RCP start for training with the RCS solid, number 1 seal dp reads 100 psid.
- c. During a RCP start in Mode 3, number 1 seal injection water temperature reads 122 degrees.
- d. During a RCP start in Mode 4, S/G water temp reads 40 degrees above RCS cold leg temp.

QUESTION: 082 (1.00)

WHICH ONE of the following will occur if the VCT level instrument LT-112 fails HIGH? Assume NO operator action is taken.

- a. Charging pump suction will shift to the RWST at 2% actual level.
- b. VCT high level alarm will actuate; actual VCT level will remain constant.
- c. LCV-112B will partially divert flow to the holdup tanks.
- d. VCT will empty and charging pumps will lose suction.

QUESTION: 083 (1.00)

WHICH ONE of the following groups of plant parameters are inputs for the Safety Injection Signal?

- a. RCS Pressure, Containment Pressure, RCS Temperature
- b. RCS Pressure, PZR Level, Steam Line Pressure
- c. PZR Pressure, PZR Level, RCS Temperature
- d. PZR Pressure, Containment Pressure, Steam Line Pressure

QUESTION: 084 (1.00)

WHICH ONE of the following conditions will cause Area Radiation Monitoring System "Channel in High Alarm"?

- a. Steam Generator Tube Rupture.
- b. Reactor Coolant System (RCS) to Component Cooling Water System (CCWS) leak.
- c. Gas storage tank rupture.
- d. Main steam line break.

QUESTION: 085 (1.00)

The following plant conditions exist:

- Unit 1 is in Mode 2 at 3% power.
- Tavg indication is 550 degrees F.

WHICH ONE of the following actions is the MINIMUM necessary to comply with Technical Specification 3.1.1.4, "Minimum Temperature For Criticality"?

- a. Restore Tavg to greater than 561 degrees within 15 minutes or be in HOT STANDBY within the next 15 minutes.
- b. Restore Tavg to greater than 551 degrees within 15 minutes or be in HOT STANDBY within the next 15 minutes.
- c. Restore Tavg to greater than 561 degrees within 15 minutes or be in HOT STANDBY within the next 30 minutes.
- d. Restore Tavg to greater than 551 degrees within 15 minutes or be in HOT STANDBY within the next 30 minutes.

QUESTION: 086 (1.00)

WHICH ONE of the following provides input to the Rod Insertion Limit Monitor for reactor power?

- a. Auctioneered high Tave
- b. Auctioneered high Tref
- c. Auctioneered high N-16 power
- d. Auctioneered high delta T

QUESTION: 087 (1.00)

WHICH ONE of the following discharges directly to the Pressurizer Relief Tank (PRT)?

- a. RHR Pump Suction Relief Valve(s).
- b. RCP #2 Seal Leakoff.
- c. Component Cooling Water Pump Discharge Relief Valve(s).
- d. Charging Pump Discharge Relief Valve(s).

QUESTION: 088 (1.00)

WHICH ONE of the following should have occurred as Component Cooling Water (CCW) surge tank level decreases to 58% (Side "A")?

- a. A Train safeguards loop isolation HV4512 and HV4514 auto close.
- b. B Train safeguards loop isolation HV4513 and HV4514 auto close.
- c. CCW Surge tank empty alarm actuates.
- d. Makeup is auto-initiated on a lo-lo level signal.

QUEST JN: 089 (1.00)

Unit 2 is operating at 35% power when Reactor Coolant Pump 2 trips. WHICH ONE of the following describes the INITIAL unit response of the affected S/G to the RCP trip? Assume NO operator action.

- a. A reactor trip will not occur but steam generator water level will shrink.
- b. A reactor trip will not occur but steam generator water level will swell.
- c. A reactor trip will occur and steam generator water level will shrink.
- d. A reactor trip will occur and steam generator water level will swell.

QUESTION: 090 (1.00)

A leak in WHICH ONE of the following heat exchangers would cause a dilution of the RCS?

- a. RCP thermal barrier heat exchanger
- b. Seal water return heat exchanger
- c. Letdown heat exchanger
- d. Primary sample cooler

QUESTION: 091 (1.00)

Given the following conditions:

- Reactor power 38%
- Pressurizer pressure is 1985 psig and decreasing at 1 psig/min.
- One Pressurizer spray valve indicates open; controller in auto and demand position is zero.

WHICH ONE of the following actions MUST be performed by the operators per ABN-705, "Pressurizer Pressure Malfunction"?

- a. Trip the Reactor, then trip the associated RCP.
- b. Trip the associated RCP; if pressure continues decreasing then initiate Safety Injection.
- c. Attempt to manually close the spray valve; if pressure continues decreasing then trip the associated RCP.
- d. Attempt to manually close the spray valve; if pressure continues decreasing then manually initiate Safety Injection.

QUESTION: 092 (1.00)

WHICH ONE of the following is the minimum hydrogen concentration which requires engineering support personnel analysis prior to Hydrogen Recombiner operation?

- a. minimum detectable.
- b. 0.5%
- c. 6.0%
- d. 18.0%

QUESTION: 093 (1.00)

Unit 1 is operating at 100% power when a toxic gas (carbon dioxide) forces the evacuation of the Control Room. In accordance with A1W-905A "Loss of Control Room Habitability", the Shift Supervisor orders a Reactor Trip.

WHICH ONE of the following should be performed PRIOR to leaving the Control Room?

- a. Perform a closure of MSIV's and secure main feed.
- b. Deenergize both Rod Drive Motor-Generator sets by taking the motor and generator control switch handles to PULL-OUT.
- c. Verify turbine trip and shift charging pump suction to RWST.
- d. Verify auxiliary feed actuation and activate the Control Room Evacuation Alarm.

QUESTION: 094 (1.00)

During a reactor startup when all control rods are fully inserted, it is desirable to reinstate the ROD BOTTOM ALARMS while withdrawing control rods in normal sequence. Which of the following statements describes the condition that will reinstate the Rod Bottom Alarms?

- a. After the control bank "D" rods are above the rod insertion limit and the Bank Overlap Unit is manually reset.
- b. When all shutdown banks are fully withdrawn and the Bank Overlap Unit is manually reset.
- c. When all shutdown rods are fully withdrawn and control bank "A" rods are withdrawn greater than 6 steps.
- d. When all shutdown rods are fully withdrawn and all control banks are withdrawn greater than 6 steps.

QUESTION: 095 (1.00)

WHICH ONE of the following actions is required if the main turbine does not trip automatically following a reactor trip and cannot be tripped from the MCB, per EOP-0.0 "Reactor Trip or Safety Injection"?

- a. Trip the Local Trip Valve at the Hydraulic Control Rack.
- b. Secure the condenser vacuum pumps and break condenser vacuum.
- c. Manually RUNBACK the turbine at maximum rate.
- d. Open the main generator output breakers.

QUESTION: 096 (1.00)

If the RCPs were lost due to a loss of offsite power, WHICH one of the following is an indication of the establishment of natural circulation, per ECA-0.1A "LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED"?

- a. RCS subcooling greater than 20 degrees F.
- b. RCS Tc stable or increasing.
- c. RCS Th stable or decreasing.
- d. s/G pressure stable or increasing.

QUESTION: 097 (1.00)

WHICH ONE of the following describes the initial response THEN final condition of RCS Tavg and PRZR Press. respectively, given the following conditions?

- 250 Effective Full Power Days (EFPD) in this core cycle
- 85% Reactor Power for last 35 days
- Rod Control in MANUAL
- All other control systems in AUTOMATIC

The control room operators conduct a boration at the maximum rate to increase RCS boron concentration by 10ppm. Assume no other operator action.

- a. Both increase THEN Both return to their initial values.
- b. Both decrease THEN Both return to their initial values.
- c. Both decrease THEN only Tavg returns to its' initial value.
- d. Both decrease THEN only PRZR Press. returns to its' initial value.

QUESTION: 098 (1.00)

WHICH ONE of the following is the Technical Specification MINIMUM required action to be taken if a Safety Limit is violated?

- a. Notify NRC Regional Office AND be in HOT STANDBY within six hours.
- b. Notify NRC Regional Office AND be in HOT STANDBY within one hour.
- c. Notify NRC Operations Center within one hour and be in HOT STANDBY within six hours.
- d. Notify NRC Operations Center AND be in HOT STANDBY within one hour.

QUESTION: 099 (1.00)

WHICH ONE of the following conditions REQUIRES that every effort be made to provide double valve isolation per STA-605 "CLEARANCE AND SAFETY TAGGING"? (Assume NO Unit 1/Unit 2 INTERFACE equipment involved)

- a. When the fluid system is potentially contaminated above minimum detectable activity.
- b. When the fluid system is extremely caustic.
- c. When the fluid system is pressurized greater than 400 psig OR at a temperature greater than 185 F.
- d. When the fluid system is being hydrostatically tested.

QUESTION: 100 (1.00)

WHICH ONE of the following individuals may authorize operation of an ISOLATION POINT during emergency conditions to protect personnel without prior approval per STA-821, "Unit Interfaces and Isolation Control Program."?

- a. Shift Supervisor.
- b. Work Control SRO.
- c. Any actively licensed operator.
- d. Any Interface Committee member.

(***** END OF EXAMINATION *****)

ANSWER KEY

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

ANSWER KEY

046	b	069	d
047	d	070	b
048	b	071	d
049	a	072	c
050	b	073	b
051	b	074	d
052	d	075	c
053	b	076	d
054	b	077	d
055	a	078	a
056	c	079	c
057	a	080	a
058	b	081	b
059	a	082	d
060	b	083	d
061	b	084	c
062	a	085	b
063	b	086	c
064	b	087	a
065	b	088	d
066	a	089	a
067	d	090	b
068	a	091	c

ANSWER KEY

092 ~~a~~ C (KEY INCORRECT, CORRECT ANSWER "C")
093 c
094 c
095 a
096 ~~d~~ C (KEY INCORRECT, CORRECT ANSWER "C")
097 d
098 d
099 d
100 a

(*****" END OF EXAMINATION *****)