

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/OL-96-01

FACILITY

Duane Arnold Energy Center

License No. DPR-29

LICENSEE

IES Utilities, Incorporated

IE Towers

P.O. Box 351

Cedar Rapids, IA 52406

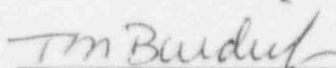
DATES

January 19, 1996

CHIEF EXAMINER

R. Doornbos, RIII

APPROVED BY


T. M. Burdick, Chief
Operator Licensing Branch

1/25/96
Date

Examination Summary

Examination administered January 19, 1996 (Report No. 50-331/OL-96-01)

Initial license written retake examination was administered to one (1) individual applying for Reactor Operator (RO) license.

Results: The applicant passed the written re-examination. Based on his previous successful completion of the operating portion of the initial exam and his passing this written retake examination, he was issued a license to operate your Duane Arnold Energy Center facility.

Because of the small sample size there were no strengths or weaknesses identified.

REPORT DETAILS

1. Examiner

*R. Doornbos, RIII NRC

2. Persons Contacted

Facility

*John Christenson

*Jeffrey N. Pladsen

Wayne Render

*Denotes those present at the exit meeting on January 19, 1996.

3. Written Examination

The written examination was a standard, 100 question, multiple choice examination prescribed by NUREG 1021, Section 401. The exam was administered in the Region III office, graded, and the license issued prior to the candidate departing the Region. No post examination comments were submitted to the NRC for consideration following the examination.

4. Exit Meeting

An exit meeting was held on January 19, 1996. Those attending are listed in Section 2 of this report. The operator's performance on the written exam was discussed during the exit. The facility licensee did not identify as proprietary any of the materials provided to or reviewed by the examiners.

U. S. NUCLEAR REGULATORY COMMISSION
SITE SPECIFIC EXAMINATION
REACTOR OPERATOR LICENSE
REGION 3

CANDIDATE'S NAME: MASTER EXAMINATION
FACILITY: Duane Arnold
REACTOR TYPE: BWR-GE4
DATE ADMINISTERED: 96/01/19

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>100.00</u>	<u> </u>	<u> </u> %	TOTALS
	<u>FINAL GRADE</u>		

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

Candidate's Signature

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

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

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

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

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

- 092 a b c d ___
- 093 a b c d ___
- 094 a b c d ___
- 095 a b c d ___
- 096 a b c d ___
- 097 a b c d ___
- 098 a b c d ___
- 099 a b c d ___
- 100 a b c d ___

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

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)

In accordance with Technical Specifications, WHICH ONE (1) of the following SCRAMS are NOT required to be operable when subcritical with the water temperature less than (<) 212 deg F?

- a. High flux IRM
- b. APRM 15% flux
- c. Mode switch to Shutdown
- d. Reactor low water level

QUESTION: 002 (1.00)

WHICH ONE (1) of the following is the pressure boundary for the IRM detector assembly?

- a. Shuttle tube
- b. Guide tube
- c. Drive tube
- d. Dry tube

QUESTION: 003 (1.00)

WHICH ONE (1) of the following signals will NOT isolate Reactor Water Cleanup Valve MO-2700, RWCU Supply Inboard Isolation Valve.

- a. RWCU High Differential Flow at 40 gpm with 45 second time delay.
- b. Activation of the Standby Liquid Control System.
- c. RWCU Area Ambient Temperature at 130 degrees F.
- d. RWCU Area Differential High Temperature at 14 degrees F above 100% power operation Ambient Temperature.

QUESTION: 004 (1.00)

WHICH ONE (1) of the following conditions will NOT cause a "half scram" OR a "full scram" to be generated by the Reactor Protection System (RPS)?

- a. Closure of the outboard MSIV's in steam line "A" and "C" with reactor power at 50%.
- b. Mode switch in "Refuel" and spurious signal causes High Drywell pressure switch to activate.
- c. IRM "C" and "D" are inoperable with reactor power at 20%.
- d. Scram Discharge Volume high water level of 70 gallons.

QUESTION: 005 (1.00)

Assume all the required conditions have been met for the Automatic Depressurization System (ADS) initiation AND depressurization is in progress. If ALL Residual Heat Removal (RHR) pumps and Core Spray pumps trip off, WHICH ONE (1) of the following describes the effect this will have on the Automatic Depressurization System?

- a. Depressurization will be automatically reestablished immediately after the core spray or RHR pumps are restored.
- b. Both timer reset pushbuttons must be depressed and held for continued depressurization.
- c. Timer override switch for both ADS logics are placed in "override" position.
- d. Depressurization continues without core spray or RHR pumps running.

QUESTION: 006 (1.00)

WHICH ONE (1) of the following statements describes the shorting links that are used in Reactor Protection System (RPS)?

- a. Installation of the shorting links activates the SRM Scrams and bypasses the IRM and APRM scrams.
- b. Removal of the shorting links activates the SRM scrams in a coincidence of one-out-of-two-twice logic scheme.
- c. Installation of the shorting links activates the SRM, IRM and APRM scrams in coincident logic schemes.
- d. Removal of the shorting links activates the SRM, IRM and APRM scrams in non-coincident logic schemes.

QUESTION: 007 (1.00)

Which of the following correctly describes normal operation of the Rod Block Monitor (RBM) system?

- a. With the reactor at 100%, a control rod selected, and the RBM/APRM ROD BLOCK SETPOINT pushbuttons depressed, the red pen of the RBM recorders will indicate the average of the LPRM detectors for the area adjacent to the selected rod.
- b. If the ROD SELECT POWER Switch C11A-S1 is turned OFF, then when it is turned back on, select a center rod, then the in-sequence rod to ensure the RBM System enforces rod blocks.
- c. Upon bypassing one channel of the RBM, the ROD OUT INHIBIT light on Panel 1C37 will turn ON, but the rod out inhibit output from the RBM channel is bypassed.
- d. With the reactor at less than 100%, the RBM meter will display the current reactor power immediately following completion of the nulling sequence.

QUESTION: 008 (1.00)

During power operations an operator opens the battery supply breaker to the 250 volt battery system and only the charger is supplying bus voltage. WHICH ONE (1) of the following will be the response of the system during emergency load starting requiring 250 volt power?

- a. The charger will trip on high starting currents associated with emergency loads.
- b. The charger will supply emergency loads under these conditions for one hour.
- c. The charger will supply both normal and emergency loads for four hours.
- d. The charger will supply the emergency loads for four hours.

QUESTION: 009 (1.00)

Concerning Uninterruptible AC, WHICH ONE (1) of the following conditions will NOT cause the Invertor Static Switch to transfer the Uninterruptible AC loads to the Regulating Transformer 1Y1A?

- a. Invertor voltage 105% of nominal
- b. Invertor voltage 80% of nominal
- c. Blown fuse in the Invertor
- d. Invertor Overload

QUESTION: 010 (1.00)

Assume the feedwater level control system is being operated in 3-element control using reactor level detector channel "A". Reactor power is at 85%, steady state. WHICH ONE (1) of the following causes reactor level to decrease?

- a. Channel "A" reactor level detector signal fails low.
- b. Loss of signal to "B" feedwater control valve M/A transfer station, when the switch is in manual.
- c. "B" feedwater line flow signal fails high.
- d. "A" steam flow signal fails high

QUESTION: 011 (1.00)

The Main Turbine trip has just occurred. In accordance with Integrated Plant Operating Instruction No. 4 "Shutdown" PRECAUTIONS AND LIMITATIONS SECTION, WHICH ONE (1) of the following is the condition requiring opening the main condenser vacuum breakers?

- a. High Differential expansion
- b. Moisture Separator Reheater High level
- c. High Thrust Bearing wear
- d. Low Lube Oil Pressure

QUESTION: 012 (1.00)

An instrument technician informs you that he inadvertently deenergized RPS power from cabinet 1C-42 while performing maintenance on PCIS cabinet 1C-42. This will result in a Group II isolation, with the exception of

- a. the Drywell equipment drain sump discharge valves
- b. the Drywell floor drain sump discharge valves
- c. RHR sample and discharge to Radwaste
- d. the TIP valves

QUESTION: 013 (1.00)

Which ONE of the following automatic actions will initiate the "A" Recirculation Pump MG Drive Motor trip annunciator?

- a. "A" Recirculation MG drive Motor breaker closed
- b. "A" Recirculation MG Set Scoop Tube Locked up
- c. "A" Recirculation MG Field breaker opened
- d. "A" RPT Breaker opened

QUESTION: 014 (1.00)

Which ONE of the following describes the impact on the Core Spray Cooling leak detection system of a rupture of the low leg piping just below the core plate region of the core?

- a. System will alarm due to the decrease in pressure generated on the low leg of the d/p cell.
- b. System will alarm due to the increase in pressure generated on the low leg of the d/p cell.
- c. System will not alarm because the alarm setpoint cannot be reached for a leak in this location.
- d. System will function normally because the low leg is designed to sense pressure below the core plate.

QUESTION: 015 (1.00)

A reactor scram has occurred. Just prior to placing the Mode Selector Switch to SHUTDOWN, the reactor operator notices that reactor pressure is 875 psi and is rapidly decreasing. Which ONE of the following is a possible explanation for these indications?

- a. Normal indications on a reactor scram.
- b. Reactor recirculation pump runback to 20%.
- c. Failure of the MSIV closure to operate.
- d. Failure of the EHC system.

QUESTION: 016 (1.00)

A scram has occurred. The following plant conditions exist:

- The SDV is full
- The scram pilot valve air header is "0" psig
- 17 control rods are NOT fully inserted
- Reactor power is stable at 12%

Which ONE of the following methods is to be used to insert the remaining control rods?

- a. Initiate ARI.
- b. Vent the scram air header.
- c. De-energize the scram solenoids.
- d. Reset the scram to drain the SDV and rescrام.

QUESTION: 017 (1.00)

The reactor is operating at 100% power when circulating water pump A trips. The crew reduces recirculation flow to 24×10^6 lbs/m flow/hr and investigates the loss of the circulating water pump. Condenser vacuum is decreasing and is currently reading 7.0" Hg abs. Which ONE of the following is the operator action taken in this situation?

- a. Manually scram the reactor before 7.5" Hg abs.
- b. Manually scram the reactor before 19" Hg abs.
- c. Trip the turbine before 7.5" Hg abs.
- d. Trip the turbine before 19" Hg.

QUESTION: 018 (1.00)

The SGBT system is in the standby/readiness condition and the AUTO/MAN handswitch is in the AUTO position. Which ONE of the following would initiate the SGBT system?

- a. Reactor Building ventilation exhaust high radiation of 9 mr/hr.
- b. Refueling Pool exhaust high radiation of 5 mr/hr.
- c. Reactor vessel water level of +186 inches.
- d. Offgas Vent Pipe (Stack) HI-HI radiation.

QUESTION: 019 (1.00)

Shutdown cooling flow has been lost during cold shutdown conditions with both recirc pumps out of service. Which ONE of the following is the action to be taken by the operators?

- a. Enter RPV Flood and execute all applicable steps.
- b. Start both CRD pumps to increase core cooling water flow.
- c. Inject with condensate service water in accordance with IPOI 7.
- d. Maintain reactor water level above 214 inches and monitor vessel metal temperatures.

QUESTION: 020 (1.00)

The reactor is operating at 80% power when one SRV fails full open. Which ONE of the following describes the effect on reactor power? (Assume the reactor does not scram.)

- a. Power will immediately increase to 98%.
- b. Power will initially increase due to increased recirculation flow, then power will decrease and steady out at 80%.
- c. Power will initially decrease due to increased core voiding, then it will increase and steady out at 80%.
- d. Power will decrease due to turbine control valve closure in response to the decreased reactor power and will steady out at 62%.

QUESTION: 021 (1.00)

A turbine runback has initiated due to a complete loss of stator cooling. Which ONE of the following describes the operation of the turbine trip system?

- a. The turbine trips if power has not been reduced to less than 25% in two minutes.
- b. The turbine trips if power has not been reduced to less than 79.5% in two minutes.
- c. The turbine trips if power has not been reduced to less than 79.5% in 3 1/2 minutes.
- d. The turbine trips if power has not been reduced to less than 50% in 2 1/2 minutes.

QUESTION: 022 (1.00)

The reactor is operating at 100% power when a trip of Condensate Pump 1P-8A occurs. Which ONE of the following describes the automatic response to the condensate pump trip?

- a. Both feed pumps trip and initially recirculation flow runs back to 45% of rated flow.
- b. Feed pump 1P-1A trips and initially recirculation flow runs back to 20% of rated flow.
- c. Both feed pumps trip and initially recirculation flow runs back to 20% of rated flow.
- d. Feed pump 1P-1A trips and initially recirculation flow runs back to 45% of rated flow.

QUESTION: 023 (1.00)

Which ONE of the following describes the resulting actions when the Standby Gas Treatment TEST pushbutton (PB-5831A) is depressed during normal plant operation?

- a. Both trains of Standby Gas Treatment start, Standby Gas Treatment train B stops when flow is sensed in train A.
- b. The pushbutton will have no effect unless secondary containment isolation has first been initiated.
- c. Standby Gas Treatment train A will initiate and secondary containment isolation will initiate.
- d. Standby Gas Treatment train A will initiate but secondary containment will not isolate.

QUESTION: 024 (1.00)

The plant is at 100% power. You are making rounds in the turbine building. The AC incandescent lighting fixtures suddenly go dark. Assuming no other failures, what is the status of the plant DC systems?

- a. The 24 VDC and 125 VDC systems are on batteries; 250 VDC system is unaffected.
- b. The 125 VDC system is on batteries; 24 VDC and 250 VDC systems are unaffected.
- c. The 24 VDC system is on batteries; 125 VDC and 250 VDC systems are unaffected.
- d. The 125 VDC system switches to the third battery charger; the charger is fed from the either essential bus; 24 VDC and 250 VDC are unaffected.

QUESTION: 025 (1.00)

Which ONE of the following describes the operation of the KAMAN System?

- a. The system contains 11 monitors which constantly monitor the gaseous effluent for both normal and accident conditions.
- b. The system contains 11 monitors which constantly monitor the gaseous effluent, but normal monitors sway from remote to local mode under accident conditions.
- c. 6 normal monitors are in service during normal operational conditions, but they are bypassed and the accident monitors are placed in service on increasing radiation.
- d. 5 accident monitors are in service during normal operation, but sample different flow paths than the normal monitors.

QUESTION: 026 (1.00)

Which ONE of the following isolation signals will result in closure of the Reactor Water Cleanup (RWCU) outboard isolation valve only?

- a. Reactor Water Cleanup high differential flow
- b. Non-regenerative heat exchanger outlet high temperature
- c. Reactor Water Cleanup area ambient high temperature
- d. Reactor Water Cleanup area differential high temperature

QUESTION: 027 (1.00)

A break has occurred in the steam supply line to the Reactor Core Isolation Cooling system upstream of the high flow sensing location. Which ONE of the following will provide system isolation under this condition?

- a. Reactor pressure low (50 psig)
- b. RCIC emergency area cooler high temperature (175 deg F)
- c. RCIC equipment room high vent inlet/outlet differential temperature (50 deg F)
- d. Suppression pool area vent air high temperature (150 deg F)

QUESTION: 028 (1.00)

During a LOCA the LPCI Loop Select Logic has determined that recirculation loop A pressure is 2 psig higher than loop B. Which ONE of the following describes the logic and loop selection for the LPCI system?

- a. The logic determines that the LOCA is in loop A and selects loop B for injection.
- b. The logic determines that the LOCA is in loop B and selects loop A for injection.
- c. The logic determines that there is no LOCA condition and selects loop A for injection.
- d. The logic determines that there is no LOCA condition and injects into both loops.

QUESTION: 029 (1.00)

Given the following plant conditions:

Reactor Power 80%
Both Reactor Feed Pumps operating
Two recirculation pumps in operation
Normal reactor water level

RFP "A" trips resulting in an RPV water level of 150". Which one of the following describes the reactor recirc system response following the transient?

- a. 'A' recirculation pump trips, 'B' runs back to minimum speed
- b. Both recirculation pumps run back to 45% speed
- c. Both recirculation pumps run back to 20% speed
- d. No recirculation pump runback occurs

QUESTION: 030 (1.00)

Elevated drywell temperatures may result in erroneous RPV water level indications. Which ONE of the following level instruments may not be valid due to elevated temperatures?

- a. Wide range GEMAC (Floodup)
- b. Narrow range Barton
- c. Narrow range GEMAC
- d. Fuel Zone

QUESTION: 031 (1.00)

Consider all the following information:

- The reactor is at 100% power
- APRM CHANNEL A is reading 103%
- APRM CHANNEL B is reading 105%
- APRM CHANNEL C to F are reading 100%
- RBM CHANNEL A is reading 97%
- RBM CHANNEL B is reading 99%
- FLOW DRAWER A output is 90%
- FLOW DRAWER B output is 97%
- FLOW DRAWER C output is 98%
- FLOW DRAWER D output is 102%
- 5 LPRM signals to APRM CHANNEL E are bypassed (3 level A, 2 level B)

Which ONE of the following alarms would be received?

- a. RWM ROD BLOCK
- b. APRM CHAN B, D, F, UPSCALE ALARM
- c. APRM CHAN A, C, E, UPSCALE ALARM
- d. RBM UPSCALE OR INOP

QUESTION: 032 (1.00)

A TIP machine is driving into the core for a TIP Trace when a Reactor Feedwater pump trip occurs causing reactor water level to drop below +170 inches. Which ONE of the following correctly describes the response of the TIP system?

- a. The TIP Shear Valve automatically fires to cut the detector cable and seal the guide tube.
- b. The TIP Guide Tube Ball Valve automatically closes, cutting the detector cable and sealing the guide tube.
- c. The TIP will go to the Manual Reverse Mode and withdraw, allowing the Ball Valve to close and seal the guide tube.
- d. The TIP continues driving to full in then shifts to Auto Reverse mode and the TIP Guide Tube Ball Valve automatically closes.

QUESTION: 033 (1.00)

The reactor is operating at 100% power when the "AIR EJECTOR OUTLET TO OFFGAS CV-1359 ISOLATION ALARM" annunciates on panel 1C07B. Which ONE of the following is a potential cause for this alarm?

- a. SJAE driving steam supply pressure of 250 psig from the main steam system.
- b. Main Turbine trip at 7.5" Hg abs.
- c. 12 psig upstream of the recombiner unit.
- d. Hydrogen concentrations at the discharge of the SJAE in excess to 4%.

QUESTION: 034 (1.00)

The Residual Heat Removal System is operating in the Shutdown Cooling Mode on the B loop with RHR pump B running. Reactor water level begins to decrease and reaches 170 inches. Which of the following statements are TRUE?

- a. MO-1908 (inboard SDC isolation valve) closes, MO-1909 (outboard SDC isolation valve) closes, B RHR pump will be running .
- b. MO-1908 (inboard SDC isolation valve) closes, MO-1909 (outboard SDC isolation valve) closes, B RHR pump trips.
- c. MO-1908 (inboard SDC isolation valve) closes, MO-1904 (outboard injection isolation valve) closes, B RHR pump trips.
- d. MO-1909 (outboard SDC isolation valve) closes, MO-1905 (inboard injection isolation valve) closes, B RHR pump will be running.

QUESTION: 035 (1.00)

Which one of the following is the preferred method of controlling plant pressure for Non-ATWS situations?

- a. Load Set
- b. Bypass Jack
- c. Pressure Set
- d. Maximum Combined Flow

QUESTION: 036 (1.00)

The reactor vessel head seals are DESIGNED to:

- a. detect refueling bellows assembly leakage during refueling operations.
- b. have continuous leakoff between the inner and outer seal.
- c. permit no detectable leakage.
- d. detect outer seal leakage.

QUESTION: 037 (1.00)

Prior to rod withdrawal in STARTUP or REFUEL _____ SRM(s) must have an observed count rate equal to or greater than _____ cps.

- a. 1, 3
- b. 2, 3
- c. 2, 10
- d. 1, 10

QUESTION: 038 (1.00)

Which annunciator combination would you expect to see during a loss of instrument and service air?

- a. "A" RWS pit Lo Level and Demin Water Tank 1T-45 Lo-Lo Level.
- b. RWM Rod Block and Scram Air Header Hi/Lo Pressure
- c. Scram Air Header Hi/Lo Pressure and Rod Out Block
- d. SBLC Tank Hi/Lo Level and Rod Drift

QUESTION: 039 (1.00)

CRD Pump 1P-209A has tripped. After you start the standby pump, a Second Assistant reports that it sounds like rocks rolling around in the CRD pump. Motor current is about 9 amps and no local flow noise is present. Which of following is the immediate response to this condition?

- a. Immediately stop the pump and re-vent CRD system components.
- b. Immediately stop the pump and verify the oil level in the pump.
- c. Immediately shut the discharge valve and re-verify the system lineup.
- d. Immediately begin opening the pump discharge valve until pump amperage reads 11 amps.

QUESTION: 040 (1.00)

The plant is operating at power. A second assistant reports there is about 10 inches of water accumulating on the floor in the RHR Corner Room SE Area and it appears to be from floor drains backing up. You should:

- a. Operate available sump pumps to maintain water level less than 6 inches.
- b. Begin reactor shutdown per IPOI 3, 4, or 5 as appropriate.
- c. emergency depressurize.
- d. scram the reactor.

QUESTION: 041 (1.00)

The plant has been operating for several days at high power. A severe storm is causing disturbances on the electrical distribution system and a partial generator load loss has occurred. The following conditions are noted:

Reactor vessel level is +189 inches and decreasing slowly
Reactor vessel pressure 1059 psig and increasing
Drywell pressure 0.3 psig and stable

Your immediate actions are to:

- a. commence an orderly shutdown per IPOI-4 (Shutdown).
- b. manually scram the reactor per IPOI-5 (Reactor Scram).
- c. switch to the other EHC pressure control unit and verify a 5 psi bias.
- d. depress LLS A and B Logic Lo-Lo Set Arming Reset to prevent unnecessary opening of SRVs.

QUESTION: 042 (1.00)

Reactor pressure increases to 1110 psig. Which statement describes the response of the Safety Relief valves to this event?

- a. One (1) SRV opens in pressure relief mode.
- b. One (1) SRV opens initially and one (1) additional SRV opens on LLS logic.
- c. One (1) SRV opens initially and two (2) additional SRVs open on LLS logic.
- d. One (1) SRV opens on LLS logic.

QUESTION: 043 (1.00)

OI-324 requires operation of the diesel generator at greater than 25% load to prevent souping. Which of the following is a possible consequence of souping?

- a. Bearing failure due to oil separation.
- b. Injector failure due to incomplete combustion.
- c. Exhaust system fire due to combustion product build-up.
- d. Engine failure due to water accumulation in the fuel oil.

QUESTION: 044 (1.00)

A reactor heatup from cold conditions is in progress. Which of the following represents the relationship between actual reactor water level and the water level indicated on the wide range Yarways?

- a. Actual water level increases and indicated level increases.
- b. Actual level decreases and indicated level decreases.
- c. Actual level decreases and indicated level remains the same.
- d. Actual level increases and indicated level remains the same.

QUESTION: 045 (1.00)

The reactor is considered unstable and shall be manually scrammed if:

- a. The reactor is operating in the surveillance region and 2 APRMs show peak-to-peak swings of 8% increasing.
- b. The reactor is operating in the forbidden region and 3 APRMs show peak-to-peak swings between 6% and 8% and increasing.
- c. The reactor is operating in the forbidden region with 3 APRMs showing 8% peak-to-peak and increasing.
- d. The reactor is operating at 100% power with 1 APRM having peak-to-peak swings of 12% and increasing.

QUESTION: 046 (1.00)

The design pressure of the drywell and suppression chamber is:

- a. 53 psig
- b. 56 psig.
- c. 62 psig
- d. 70 psig

QUESTION: 047 (1.00)

The High Reactor Water Level Trip at 211 inches is designed to protect the:

- a. Main Turbine Bypass and Control Valves from thermal shock.
- b. Reactor feed pumps from run-out conditions.
- c. MSIVs from excessive hydraulic loading.
- d. HPCI Turbine from moisture carryover.

QUESTION: 048 (1.00)

What, if any, automatic actions will occur with the River Water make-up valves (CV-4914 and 4915) and the Radwaste Dilution valves (CV-4910A and B) on low level in the ESW/RHRSW wet pit?

- a. None.
- b. Only the River water make-up valves will open.
- c. Only the Radwaste dilution line valves will close.
- d. The River water make-up valves will open and the Radwaste dilution line valves will close.

QUESTION: 049 (1.00)

Given the following conditions:

Reactor is operating at 100%
B CRD pump tagged out
B GSW pump tagged out
B SBTG tagged out

An overcurrent trip of the A GSW pump occurs and the C GSW pump fails to start. Estimated time of recovery for the GSW system is 10 minutes. Which of the following is the proper operator action(s) in accordance with AOP 411, "GSW Abnormal Operation"?

- a. Reduce reactor power by 20%, while waiting 10 minutes GSW restoration secure GSW loads as practical, if GSW is not available after 10 minutes, manually scram the reactor.
- b. Reduce reactor power with recirculation pumps and send an operator to verify GSW flow and reset the lockout relay.
- c. Insert Cram Group and secure Reactor Water Cleanup per OI 261.
- d. Manually scram the reactor.

QUESTION: 050 (1.00)

The control room operator is in the process of withdrawing rods. The offgas post-treatment radiation HI alarm has just alarmed on Panel 1C03A and the operator states that the monitor is steadily increasing. He estimates that at the present rate the HI-HI-HI alarm will be reached in 5 minutes. Which one of the following describes the action you should take?

- a. Immediately scram the reactor and close the MSIVs.
- b. Immediately reduce reactor power to stabilize coolant activity levels.
- c. Monitor reactor power during the increase. If off-gas radiation levels reach the isolation setpoint and off-gas isolates, immediately scram the reactor.
- d. Commence a normal reactor shutdown by inserting control rods per the approved control rod sequence and while attempting to determine the cause of the high radiation levels.

QUESTION: 051 (1.00)

The plant is experiencing an ATWS. You have been directed by the OSS to initiate SBLC and inform him when you have injected the HOT SHUTDOWN BORON WEIGHT into the RPV. The hot shutdown boron weight is:

- a. 14% level in the SBLC tank.
- b. 3 barrels of boric acid or 3 barrels of Borax.
- c. 4 barrels of Borax or 4 barrels of boric acid.
- d. 28% level in the SBLC tank.

QUESTION: 052 (1.00)

Which of the following will result in the closing of the Secondary Containment isolation dampers?

- a. One of the two in series dampers will close on loss of power, the other on a loss of service air.
- b. One of the two parallel dampers will close on a loss of power, the other on a loss of instrument air.
- c. A HI radiation alarm received on the Offgas Vent Pipe (Stack).
- d. Taking both fuel pool rad monitors out of operate.

QUESTION: 053 (1.00)

Which one of the following explains the need for core orificing?

- a. Core orificing assures that sufficient moderator is provided to the higher powered peripheral core bundles.
- b. Improper orificing would result in reduced cooling and fuel damage in the outer core bundles.
- c. Improper orificing would result in unequal flux distribution throughout the core.
- d. Core orificing ensures that 10% of the core flow is forced through the fuel bundles to assure proper flux distribution throughout the core.

QUESTION: 054 (1.00)

Which one of the following initiates the Anti-motoring Trip of the GENERATOR BACKUP LOCKOUT RELAY?

- a. Undervoltage on the generator output following a turbine trip will trip the generator output breakers after a 1 minute time delay.
- b. Reverse power on the generator output following a turbine trip will trip the generator output breakers after a 2 second time delay.
- c. The generator output breaker will trip 2 minutes after the closure of the main turbine stop and intermediate stop valves.
- d. Reverse power on the generator output following a turbine trip will trip the generator output breaker after a 1 second time delay.

QUESTION: 055 (1.00)

Which one of the following instrument loads is lost as a result of a loss of Instrument AC Dist Panel 1Y11?

- a. Containment Atmosphere Control Panel 1C420.
- b. CRD Temperature Transmitter TT-1889A, B, and C.
- c. Feedwater and Condensate Control Panel 1C06.
- d. SRM-IRM Drive Control Relay Panel 1C64.

QUESTION: 056 (1.00)

A PCIS Group 3 isolation has occurred. You have taken manual control of the Standby Gas Treatment System (SBGT) and have placed train "B" in "MAN" and then "AUTO". Which of the following represents the current system alignment?

- a. Lockout relay tripped, heater & exhaust fan is off, Intake Valve AV5825B is closed.
- b. Lockout relay reset, heater & exhaust fan is off, Intake Valve AV5825B is closed.
- c. Lockout relay tripped, heater off, exhaust fan on, Intake Valve AV5825B is closed.
- d. Lockout relay reset, heater off, exhaust fan on, Intake Valve AV5825B is open.

QUESTION: 057 (1.00)

While performing the control rod coupling check for rod 02-23, the operator observes position 48 indication momentarily going blank followed by a Rod Drift alarm, and then position 48 indicates again with no Rod Drift alarm once the ROD DRIFT is RESET.

- a. This is abnormal because position 48 should not go blank.
- b. This is abnormal because ROD DRIFT ALARM should not actuate.
- c. This is normal since the rod is leaving an even reed position.
- d. This is normal since the rod is leaving an odd reed position.

QUESTION: 058 (1.00)

Which one (1) of the following conditions will provide a half-scrum to RPS channel B?

- a. APRM D is downscale, IRM D is INOP, mode switch is in RUN.
- b. IRM A reading 35 on Range 4, mode switch is in STARTUP, detector is selected and withdrawn.
- c. APRM F is downscale, IRM F is bypassed, mode switch is in RUN.
- d. IRM E reading 110/125ths of scale, mode switch is in STARTUP.

QUESTION: 059 (1.00)

During normal operation at 100% power an SRV fails open. In accordance with ARP 1C03A, C-5, SRV/SV TAILPIPE HI PRESS OR HI TEMP, which one of the following actions would be taken first?

- a. Reduce recirc flow to minimum and place the Reactor Mode Switch in SHUTDOWN, and perform IPOI 5.
- b. Reduce recirc flow to 24×10^6 lbm/hr and cycle the valve's handswitch.
- c. Reduce reactor power 25% and cycle the valve's handswitch.
- d. Immediately scram the reactor and perform IPOI 5.

QUESTION: 060 (1.00)

A fire has occurred in the control room control panels. The operator at 1C388 inadvertently transfers the "yellow" transfer switch to EMER before all of the other transfer switches have been transferred. While attempting to start an RHRSW pump to establish torus cooling, the operator notes that neither RHRSW pump will start. Which of the following actions should be taken?

- a. Wait until LPCI initiation is reset.
- b. Start the "A" or "C" RHRSW pump from 1C388.
- c. Bypass the LOCA override switch at 1C388 for the RHRSW pumps.
- d. Check the fuses in 1C422A for both RHRSW pumps and replace if necessary.

QUESTION: 061 (1.00)

Which of the following is correct concerning the Instrument and Service Air Compressors?

- a. If a trip occurs on the selected lead compressor, the compressor selected as lag will automatically shift to lead.
- b. When the standby compressor 1K1 is running, all three of the 1K-090 compressors may be placed in the LAG position.
- c. The standby compressor 1K1 is normally in PRIMARY and will start on a decreasing pressure of 90 psig.
- d. The LAG and LAG-LAG air compressors 1K90 A, B, or C will stop after running for 20 minutes unloaded.

QUESTION: 062 (1.00)

Following a Group 7 isolation due to a failure in PCIS, Drywell temperature and pressure have increased, resulting in a scram from HI DW pressure. Plant conditions are:

DW TEMP +160 degrees F and increasing
DW PRESS + 3 psig and increasing
RPV LEVEL +186 and increasing slowly

The OSS directs you to restore maximum DW cooling. You must perform EOP-C DEFEAT:

- a. #9 REACTOR BUILDING HVAC DEFEAT
- b. #4 DRYWELL COOLER ISOLATION and bypass main air intake well water cooling.
- c. #9 REACTOR BUILDING HVAC DEFEAT and wait until drywell pressure drops below 2 psig to shift fans.
- d. #4 DRYWELL COOLER ISOLATION and wait until drywell pressure drops below 2 psig to shift fans.

QUESTION: 063 (1.00)

DAEC has just experienced an initiation of the Automatic Depressurization System (ADS). Plant conditions are as follows:

Drywell pressure: 3.2 psig
Reactor water level: -147 inches
All RHR and Core Spray pumps: running
120 second timer: timed out
4 ADS SRVs: open
Main Steam pressure: 150 psig and lowering

Which one of the following will cause the ADS SRVs to close?

- a. Resetting the High Drywell Pressure Bypass Timer
- b. Reactor water level increases to -20 inches.
- c. Securing 4 RHR or both Core Spray pumps.
- d. Depress the ADS timer pushbutton.

QUESTION: 064 (1.00)

SELECT the FINAL plant conditions after the loss of the "A" Reactor Feed Pump (RFP) from 80% power and 80% load line. Assume no operator action and all systems work as designed.

- a. Reactor Power 50-55%
Reactor Water Level at normal level
Recirculation Pumps at 45% speed
"B" RFP amps higher than before the trip of "A"
- b. Reactor Power 50-55%
Reactor Water Level at normal level
Recirculation Pumps at 22% speed
"B" RFP amps the same as before the trip of "A"
- c. Reactor Power 60-65%
Reactor Water Level below normal level
Recirculation Pumps at 22% speed
"B" RFP amps lower than before the trip of "A"
- d. Reactor Power 60-65%
Reactor Water Level below normal level
Recirculation Pumps at 45% speed
"B" RFP amps higher than before the trip of "A"

QUESTION: 065 (1.00)

The reactor is operating at 100% power with the "B" Offgas System post treatment radiation monitor inoperable and its selector switch in STANDBY. The "A" channel subsequently fails downscale. Which one of the following describes the plant response?

- a. Bypass valve (CV-4134B) closes and treatment valve (CV-4134A) opens.
- b. Offgas system isolation to stack (CV-4108) closes immediately.
- c. MSIV closure and a reactor scram occurs.
- d. Offgas suction valve closes immediately.

QUESTION: 066 (1.00)

While operating at full load, the Rod Out Block alarm, 1C05B, A-6 is received. The operator investigates and notes the following trends or conditions:

Power is increasing on APRMs.
Generator Load is increasing.
Condenser backpressure is increasing.
Feedwater Temperature heater level controllers indicating abnormal heater levels.

These symptoms are indicative of:

- a. A steam leak in the second stage reheat line.
- b. A bypass valve failing open.
- c. A loss of feedwater heating.
- d. One TCV failing open.

QUESTION: 067 (1.00)

The temperature of the steam in the Main Steam Lines is about 547 degrees F. If an SRV were opened, the tailpipe temperature would be expected to increase and hold steady at about:

- a. 212 degrees F.
- b. 310 degrees F.
- c. 450 degrees F.
- d. 547 degrees F.

QUESTION: 068 (1.00)

During a LOCA, conditions are met to initiate ADS and the timers are timing out. With 30 seconds left on the 2 minute timers ALL RHR and CS pumps are lost due to a station blackout. Which one of the following describes the subsequent action of the ADS system?

- a. If no operation action is taken to reset the timers, the valves will open.
- b. The two minute timers will automatically stop, reset when power is restored and when timed out again the valves will open.
- c. The two minute timers will stop and when a RHR or CS pump is restarted the timers will continue with only 30 seconds left.
- d. The two minute timers will continue to time out and when a RHR or CS pump is restarted the valves will open immediately.

QUESTION: 069 (1.00)

During operations at power, annunciator 1C08A, A-8 UNINTERRUPTIBLE AC 1Y23 UNDERVOLTAGE OR INVERTOR TROUBLE alarms. The operator observes that vessel level is not changing and he is still able to page on the plant paging system. Choose the statement below that correctly identifies the proper system response.

- a. An auto transfer of static switch JS401 to emergency power source 1Y2.
- b. An auto transfer of static switch JS401 to regulating transformer 1Y4 has occurred.
- c. An auto transfer of transfer switch 1Y22 to emergency power source 1Y2A has occurred.
- d. An auto transfer of static switch JS401 to inverter 1D45 has occurred.

QUESTION: 070 (1.00)

The following conditions exist:

Drywell Pressure - 4.5 psig and increasing
Drywell Temperature - 265 deg F and increasing
RPV Water Level - +190" and steady
Torus Temperature - 97 deg F and increasing
RPV Pressure - 520 psig and decreasing
The "A" OSS directs you to maximize torus cooling on the "A"
RHR loop, shut MO-2010, and put torus and drywell sprays on
"B" RHR loop.

The RHR flow and heat exchanger conditions required to maximize torus cooling using "A" RHR loop is:

- a. 9600 gpm loop flow through the RHR heat exchanger bypass valve.
- b. 7200 gpm loop flow through the RHR heat exchanger with the heat exchanger bypass valve shut.
- c. 9600 gpm loop flow through both the heat exchanger and the heat exchanger bypass valve.
- d. 9600 gpm loop flow through the heat exchanger with the heat exchanger bypass valve fully shut.

QUESTION: 071 (1.00)

Which of the following indications should be used to determine that the rods are fully inserted following a scram?

- a. Blue scram lights and Green full in lights on 1C05.
- b. Four Rod Display
- c. Rod Log on PPC.
- d. RWM display.

QUESTION: 072 (1.00)

While shutting down the reactor, a RWM insert block is enforced. If the Emergency In/Notch Override switch is placed in the Emergency In position, the selected rod

- a. moves in, followed by the normal settle function.
- b. moves in, the normal settle function is overridden.
- c. moves in, a "Rod Drift" alarm is generated.
- d. does not move.

QUESTION: 073 (1.00)

An incident has occurred which has resulted in entry into EOP-4, Radioactivity Release Control. During performance of this EOP, the Turbine Building Ventilation shuts down. Which one of the following is the appropriate action to be taken for this condition?

- a. Stop supply fans and restart exhaust fans
- b. Restart the supply fans and exhaust fans only with approval of Health Physics
- c. Immediately restart the system to avoid buildup of airborne contamination in the Turbine Building
- d. Place supply and exhaust fans in pull-to-lock and evacuate all personnel from the Turbine Building

QUESTION: 074 (1.00)

Refueling operations are in progress. The torus has been drained IAW OI 959. Which of the following would NOT be allowed while refueling operations continue?

- a. Lowering the reactor cavity water level to 37 feet.
- b. Taking the Condensate Demineralizer System OOS.
- c. Draining the Condensate Storage Tanks (CST).
- d. Taking one EDG OOS.

QUESTION: 075 (1.00)

You aligned and initiated Drywell Spray due to a drywell temperature of 270 F. No feed is currently required for the reactor, and all primary leaks are now isolated. What happens as the spray condenses in the bottom of the drywell?

- a. It will slowly fill the containment, but not enter the suppression pool.
- b. It will rise only to the level of the pressure suppression vent lines, then flow back into the suppression pool.
- c. It will rise to the level of the pressure suppression vent lines and fill the suppression pool then the containment.
- d. It will rise to the level of the pressure suppression vent lines, then fill the suppression pool until it trips at 13.5 feet water level.

QUESTION: 076 (1.00)

The OSS determined that evacuation of the Control Room was required due to toxic fumes. Where, if anywhere, can you determine torus temperature?

- a. It cannot be determined
- b. Remote Shutdown Panel 1C-388
- c. From thermocouples you must mount on the torus
- d. You must re-enter the control room while wearing SCBA

QUESTION: 077 (1.00)

The OSS assigns you to perform STP-45C003 "RHR Service Water Pump Operability Test." During the "Preparation" part of the STP, when you prepare to start the ESW Pump A (1P-99A), you discover that it is tagged OOS. You should:

- a. verify that the tag-out is correct; if it is, then skip that section of the STP.
- b. re-schedule the test for a date after the tag-out is expected to be complete.
- c. notify the OSS of the tag-out and stop execution of the procedure until the OSS evaluates the impact of the OOS pump.
- d. write the tag-out information on the procedure, write that Loop A will not meet its surveillance because of the tag-out, then go on to the next pump.

QUESTION: 078 (1.00)

The reactor is at 33% power. All systems are operating normally. Turbine throttle pressure is 950 psig, reactor pressure is about 956 psig. The control switch for the A INBOARD MSIV shorts to the CLOSE position, and the valve closes. How does the plant respond?

- a. It scrams from high RPV pressure
- b. The TCV opens to restore the initial pressure
- c. It scrams from low 1st stage turbine pressure
- d. The bypass valves open to restore the initial pressure

QUESTION: 079 (1.00)

The reactor was at 100% power when a LOCA occurred. All but one of the conditions listed below will start the ADS timer and initiate ADS after the timer runs out. Which scenario will NOT initiate ADS?

- a. Level dropped to 40",
HPCI running,
Core Spray Pump A running.
- b. Level dropped to 0" then recovered to 60",
HPCI running,
Core Spray Pumps A and B running.
- c. Level dropped to 0", rose to 70", then dropped to 50",
RCIC running,
- d. Level dropped to 10",
RFP A running,
RFP B running,
Core Spray pump B running,
RHR pump B running,
Core Spray pump A ran 30 sec then tripped.

QUESTION: 080 (1.00)

The reactor is at 85% power in an ATWS situation. You are directed to initiate SBLC. You place the STANDBY LIQUID CONTROL switch HS-2613 in the PUMPS A and B RUN position. If the explosive valves didn't explode, what would happen to the SBLC system?

- a. The pumps wouldn't start.
- b. The pumps would start and discharge to the Test Tank.
- c. The pumps would start and discharge through the SBLC Pump relief valves.
- d. The pumps would start and dead-head against the unexploded valve.

QUESTION: 081 (1.00)

You are directed to transfer the recirculation system from SINGLE-LOOP ("A" only) to TWO-LOOP ("A" and "B") operation. Which of the following would you expect to see as you start pump "B"?

- a. INCREASE in reactor water level.
- b. "B" RECIRC PUMP MOTOR HI VIBRATION comes in.
- c. "A" RECIRC MG 20% OR 45% FLOW LIMITER IN EFFECT resets.
- d. "B" RECIRC MG 20% OR 45% FLOW LIMITER IN EFFECT comes in.

QUESTION: 082 (1.00)

The plant is operating at 100% reactor power. All systems are in a normal lineup for this power level. Annunciator 1C04C-A2, REACTOR BLDG FLOOR DRAIN SUMP HI LEAKAGE, energizes. A radwaste operator is sent to determine the cause of the alarm. He reports back 10 minutes later that the HPCI room has water in it. He reports the water is approximately 7" deep in the room and he CANNOT find the source. You should immediately:

- a. enter and execute EOP 3.
- b. begin a fast reactor shutdown.
- c. enter EOP 1, scram the reactor.
- d. begin a normal reactor shutdown.

QUESTION: 083 (1.00)

A LOCA has occurred. RPV level is 50" and stable. Torus pressure is 10 psig and increasing slowly. You are directed to spray the drywell and the torus. Which of the following is required to do this?

- a. Place the Enable Containment Spray Valve hand switch to MANUAL.
- b. Place the Enable Containment Spray Valve hand switch to NORMAL.
- c. Place the 2/3 Core Covered/LPCI Init Interlock Override Keylocked Switch for the unselected loop to NORMAL.
- d. Place the 2/3 Core Covered/LPCI Init Interlock Override Keylocked Switch for the unselected loop to MANUAL OVERRIDE.

QUESTION: 084 (1.00)

The reactor is at 100% power when a loss of RPS "A" occurs. What effect does this have on the MSIVs?

- a. All Inboard Logics trip and all Inboard valves isolate
- b. All Outboard Logics trip and all Outboard Valves isolate
- c. One half of the Inboard Logics trip, but the MSIVs do not isolate
- d. One half of the Outboard Logics trip, but the MSIVs do not isolate

QUESTION: 085 (1.00)

The reactor is at 100% power. B CRD PUMP 1P-209B is out of service. Annunciator 1C05A A-6, "'A' CRD PUMP 1P-209A TRIP OR MOTOR OVERLOAD," alarms. How is the movement of the control rods from the control room affected?

- a. Rods can only be scrammed.
- b. Rods can be scrammed or manually inserted, but not individually withdrawn.
- c. Rods can be scrammed or withdrawn, but not individually inserted.
- d. Scram Accumulator pressure assures that all functions work, although rod motion is slow, and rod cooling is lost.

QUESTION: 086 (1.00)

You and a trainee have been observing work for 20 minutes in an area with a Wet Globe Bulb Temperature of 115 F. Your RWP requires single PCs, and lists a maximum stay time of 30 minutes. You note that the trainee has a very red face and hot dry skin. From what is the trainee suffering, and what care does the trainee require?

- a. Heat Stress; exit area and rest for at least 40 minutes
- b. Heat Exhaustion; exit area and rest for at least 1 hour
- c. Heat Stroke; exit area and seek medical attention
- d. Heat Cramps; exit area and drink water

QUESTION: 087 (1.00)

Which of the following is TRUE concerning the access to locked HIGH RADIATION AREAS following a pre-job briefing?

- a. Keys for locked high radiation areas shall be issued to H.P. technicians only.
- b. A locked high radiation area may be entered alone if an alarming dosimeter is provided in addition to a radiation survey meter.
- c. Locked high radiation areas shall not be entered while the reactor is critical.
- d. Keys for locked high radiation areas shall be issued by the Operations Shift Supervisor and the Security Shift Supervisor.

QUESTION: 088 (1.00)

In which of the following are you permitted to use hand-held radios?

- a. Reactor Building
- b. Diesel Generator Rooms
- c. Reactor Building Corner Rooms Only
- d. Turbine Building near the feedwater pumps.

QUESTION: 089 (1.00)

The Area H₂ Monitor (AIS-8923) High Hydrogen Concentration annunciator is in. What MINIMUM hydrogen concentration in air will initiate a hydrogen system shutdown?

- a. greater than 1%, but less than 2%.
- b. greater than 2%
- c. 3% or greater
- d. 4% or greater

QUESTION: 090 (1.00)

During a valve lineup on the Condensate System, the operator finds a valve that is in a position different from the valve line up sheet. No Hold Card/Warning Tag is found attached to the valve. The operator should:

- a. Notify the OSS immediately to receive instructions on what to do next.
- b. Reposition the valve and notify the OSS.
- c. Reposition the valve and write 'RSTR' in the WVD/RSTR column and initial and date the Initial/Date column.
- d. Denote valve out of position on the valve line up sheet, initial the 'Discrep' column and continue the valve line up.

QUESTION: 091 (1.00)

The reactor is operating at 100% power with the "B" Offgas System post treatment radiation monitor inoperable and its selector switch in STANDBY. The "A" channel subsequently fails downscale. Which one of the following describes the plant response?

- a. The offgas suction valve closes.
- b. An MSIV closure and a reactor scram occurs.
- c. The offgas system isolation valve to the stack (CV-4108) closes.
- d. Bypass valve (CV-4134B) closes and treatment valve (CV-4134A) opens.

QUESTION: 092 (1.00)

Exposure rates greater than .005 rem in one hour but less than .1 rem at 30 cm in one hour for an individual to a major portion of the body describes which ONE of the following areas?

- a. Radiation Area
- b. High Radiation Area
- c. Locked High Radiation Area
- d. Contamination Area

QUESTION: 093 (1.00)

An operator must work four feet from a small radiation source. The gamma/beta dose rate two feet from the radiation source is 800 mrem/hr. The operator is not allowed to receive more than 1 Rem on this job. Which ONE of the following describes the length of time the operator can work in the area?

- a. 2 hours
- b. 3 hours
- c. 4 hours
- d. 5 hours

QUESTION: 094 (1.00)

A "Confined Work Space Entry Permit" is designed to be in effect for _____ and a(n) _____ will "sniff" the confined space prior to entry.

- a. one shift, not to exceed 12 hours; HP
- b. one shift, not to exceed 12 hours; Chemist
- c. two shifts, not to exceed 24 hours; HP
- d. two shifts, not to exceed 24 hours; Chemist

QUESTION: 095 (1.00)

A hold tag is to be placed on the local Instrument and Service Air isolation valve to a RCIC control valve. The isolation valve is in a radiation area and is in plain sight of the control valve. Which ONE of the following describes how to place the hold tag?

- a. One individual shall place the tag on the isolation valve and shall annotate the tag and the Components Tagged Form with their initials, time, and date.
- b. One individual shall place the tag on the isolation valve and shall annotate the tag with their initials, time, and date. A second person designated by the OSS shall then sign the back of the Equipment Tagging Form.
- c. One individual shall place the tag on the isolation valve and shall annotate the tag and Components Tagged Form with their initials and date. A second individual designated by the OSS shall verify the tag installation, and then initial the Components Tagged Form.
- d. One individual shall place the tag on the isolation valve and shall annotate the tag with their initials, time, and date. A second individual designated by a licensed individual shall verify the tag installation, and then initial the Equipment Tagging Continuation Form.

QUESTION: 096 (1.00)

A maintenance worker requires temporary access to a vital area for 45 days and submits a request for Temporary Access. The access request is AUTHORIZED by the worker's job supervisor, APPROVED by ____ (1) ____, and the approved request will expire ____ (2) ____.

- a. A Security authorized Operations Shift Supervisor, 31 days after the authorization is signed.
- b. A Security authorized Maintenance Shift Supervisor, 45 days after the authorization is signed.
- c. Any Security authorized Department Supervisor, 45 days after the authorization is signed.
- d. The Security Shift Supervisor, 31 days after the authorization is signed.

QUESTION: 097 (1.00)

Given the following conditions:

Reactor power is 92%
Reactor pressure is 980 psig
Bottom head drain temperature is 475 degrees F
Recirculation 'A' loop is operating and is 550 degrees F

Which one of the following is allowed for recirc pump operation?

- a. Recirc pump 'A' speed is 85%, Recirc pump 'B' speed is 114%.
- b. Recirc pump 'A' speed is 70%, Recirc pump 'B' speed is 85%
- c. Recirc pump 'A' speed is 75%, Recirc pump 'B' speed is 101%.
- d. Recirc pump 'A' speed is 82%, Recirc pump 'B' speed is 65%.

QUESTION: 098 (1.00)

The following HPCI system conditions are observed by the NSOE:

- Loss of power to HPCI barometric condenser vacuum pump.
- Loss of power to HPCI barometric condenser condensate pump.
- Loss of power to HPCI auxiliary oil pump.
- Loss of power to all motor operated valves except MO-2238 (inboard steam isolation valve) and MO-2290A and MO-2290B (RCIC/HPCI turbine exhaust vacuum breaker valves).

Which one of the following electrical power failures would result in the above HPCI conditions?

- a. Plant 250 VDC Panel 1D41
- b. Plant 125 VDC Panel 1D13
- c. Instrument 120 VAC control power
- d. MCC 1B34 480 VAC

QUESTION: 099 (1.00)

Which one of the following modes of RHR CANNOT be controlled from the Remote Shutdown Panel?

- a. Torus cooling
- b. Shutdown Cooling
- c. LPCI injection
- d. Containment Spray

QUESTION: 100 (1.00)

The reactor is at 100% power. Annunciator 1C23A D-4, "REACTOR BLDG EXHAUST FAN 1V-EF-11A NO FLOW" alarms. What will happen to secondary containment pressure?

- a. It will remain constant because one of the reactor building supply fans will trip.
- b. It will decrease because all operating reactor building supply fans will trip.
- c. It will increase until the Group III isolation occurs because no reactor building supply fans trip.
- d. It will increase slightly but will maintain a negative pressure because the reactor building supply fans will cycle.

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

ANSWER: 001 (1.00)

d.

REFERENCE:

TS 3.1-3, table 3.1-1, item 4
212000G005 ..(KA's)

ANSWER: 002 (1.00)

d.

REFERENCE:

Lesson Plan I-2, Intermediate Range Monitor, pg 4
215003G007 ..(KA's)

ANSWER: 003 (1.00)

b.

REFERENCE:

SD-261, Rev 1, page 23
204000K108 ..(KA's)

ANSWER: 004 (1.00)

c.

REFERENCE:

SD 358, Rev 1, page 19
295006K201 ..(KA's)

ANSWER: 005 (1.00)

a.

REFERENCE:

SD 183.1, Rev 1, Figure 4, page 20
295031K208 ..(KA's)

ANSWER: 006 (1.00)

d.

REFERENCE:

SYS DESC 358, Rev 1, page 36
215004K402 ..(KA's)

ANSWER: 007 (1.00)

c.

REFERENCE:

OI 878.5, Rev 10, page 10
215002A302 ..(KA's)

ANSWER: 008 (1.00)

a.

REFERENCE:

OI 388, Rev 14, page 4
295004K201 ..(KA's)

ANSWER: 009 (1.00)

a.

REFERENCE:

SD-357, Rev 1, page 9
295003K105 ..(KA's)

ANSWER: 010 (1.00)

c.

REFERENCE:

System Description 644, Rev 1, Figure 5, page 33
295009A202 ..(KA's)

ANSWER: 011 (1.00)

d.

REFERENCE:

DAEC: IPOI-4, Shutdown, Rev 29, page 4
295005A104 ..(KA's)

ANSWER: 012 (1.00)

d.

REFERENCE:

SD-959.1, Rev 1, page 23
295020K208 ..(KA's)

ANSWER: 013 (1.00)

d.

REFERENCE:

ARP 1C04A, A-4, Rev 5, page 2
295001G005 ..(KA's)

ANSWER: 014 (1.00)

b.

REFERENCE:

SD-151, Rev 2, page 16
209001K404 ..(KA's)

ANSWER: 015 (1.00)

d.

REFERENCE:

IPOI 5, Rev 14, Section 3.2(3)(e) NOTE, page 5
295006A103 ..(KA's)

ANSWER: 016 (1.00)

d.

REFERENCE:

ATWS RPV Control
295015G010 ..(KA's)

ANSWER: 017 (1.00)

a.

REFERENCE:

ARP 1C06A, A-10, Rev 2, page 3.
295002A105 ..(KA's)

ANSWER: 018 (1.00)

d.

REFERENCE:

SD-170, Rev 2, page 10
295033A104 ..(KA's)

ANSWER: 019 (1.00)

d.

REFERENCE:

OI 149, Rev 1, Section 7.3(1)(a)(b), page 42.
295021A203 ..(KA's)

ANSWER: 020 (1.00)

c.

REFERENCE:

SD-183.3, Rev 1
239001A110 ..(KA's)

ANSWER: 021 (1.00)

b.

REFERENCE:

SD-693.1, Rev 1, page 20
245000A201 ..(KA's)

ANSWER: 022 (1.00)

d.

REFERENCE:

System Description 644, Rev 1, page 12
259001K411 ..(KA's)

ANSWER: 023 (1.00)

d.

REFERENCE:

Operating Instruction 170, Rev 20, page 4
261000G004 ..(KA's)

ANSWER: 024 (1.00)

c.

REFERENCE:

SD-375, "Plant DC Power Supply System," Rev.1, p. 12
SD-304, "Electrical Power Systems," Rev. 1, p. 27
263000K601 ..(KA's)

ANSWER: 025 (1.00)

c.

REFERENCE:

SD-879.3, Rev 2, page 9
272000A101 ..(KA's)

ANSWER: 026 (1.00)

b.

REFERENCE:

SD-261, Rev 1, page 24
204000K403 ..(KA's)

ANSWER: 027 (1.00)

a.

REFERENCE:

System Description 150, Rev 1, page 20
217000A215 ..(KA's)

ANSWER: 028 (1.00)

b.

REFERENCE:

System Description 149, Rev 2, page 18
203000K411 ..(KA's)

ANSWER: 029 (1.00)

c.

REFERENCE:

System Description 264, Rev 1, Figure 17, page 66
202002A407 ..(KA's)

ANSWER: 030 (1.00)

a.

REFERENCE:

DAEC Upgrade Program for BWROG EPG, EOP-2
295028K101 ..(KA's)

ANSWER: 031 (1.00)

c.

REFERENCE:

ARP IC-05B, B-6, Rev 5
215005K505 ..(KA's)

ANSWER: 032 (1.00)

c.

REFERENCE:

SD-878.6, Rev 1, page 21
SD-959.1, Rev 1, page 35
215001A201 ..(KA's)

ANSWER: 033 (1.00)

c.

REFERENCE:

ARP 1C07B, D-8, Rev 3, page 1
271000A301 ..(KA's)

ANSWER: 034 (1.00)

b.

REFERENCE:

OI 149, pages 33-46; SD-149, Rev 2, page 23 and Figure 20, page 50
205000K604 ..(KA's)

ANSWER: 035 (1.00)

c.

REFERENCE:

EOP-1 (RC/P), Section D, Rev 0
241000K106 ..(KA's)

ANSWER: 036 (1.00)

c.

REFERENCE:

SD-262, Rev 1, page 8
290002G004 ..(KA's)

ANSWER: 037 (1.00)

b.

REFERENCE:

T.S. 3.9.B.4, page 3.9-5
201003G005 ..(KA's)

ANSWER: 038 (1.00)

d.

REFERENCE:

AOP 518, Rev 16, page 2
211000K506 ..(KA's)

ANSWER: 039 (1.00)

a.

REFERENCE:

OI 255, Rev 34, page 17
295022A101 ..(KA's)

ANSWER: 040 (1.00)

b. a RD 1/19/96

REFERENCE:

EOP3, Secondary Containment Control, SC/L-1, Rev. 8
295036A101 ..(KA's)

ANSWER: 041 (1.00)

b.

REFERENCE:

ARP 1C05B C-4 "Reactor Vessel Hi Pressure Trip," Rev. 3, p. 2
295007A201 ..(KA's)

ANSWER: 042 (1.00)

b.

REFERENCE:

System Description 183.3, Rev 1, page 25
295025K205 ..(KA's)

ANSWER: 043 (1.00)

c.

REFERENCE:

OI-324, Rev 35, Precaution #14,
264000A404 ..(KA's)

ANSWER: 044 (1.00)

d.

REFERENCE:

System Description 880, rev 4, page 13
216000K510 ..(KA's)

ANSWER: 045 (1.00)

d.

REFERENCE:

AOP 255.2, Rev 9, page 4
295014K301 ..(KA's)

ANSWER: 046 (1.00)

b.

REFERENCE:

System Description 959, Rev 1, page 17; T.S. 3.7-23
295010K202 ..(KA's)

ANSWER: 047 (1.00)

d

REFERENCE:

SD-880, Rev 4, page 18
295008K101 ..(KA's)

ANSWER: 048 (1.00)

d.

REFERENCE:

(L)SS.102.02.01, LOR Exam Bank, Rev. 2, 03/18/94
295018K101 ..(KA's)

ANSWER: 049 (1.00)

d.

REFERENCE:

AOP-411, Rev 9, page 4
295018G010 ..(KA's)

ANSWER: 050 (1.00)

b.

REFERENCE:

AOP 672.2, Rev 13, page 5
295038K302 ..(KA's)

ANSWER: 051 (1.00)

d.

REFERENCE:

ATWS EOP, Step /L-8, Rev 5
295037K104 ..(KA's)

ANSWER: 052 (1.00)

d.

REFERENCE:

SD-170.1. Rev 1. page 8
295032K202 ..(KA's)

ANSWER: 053 (1.00)

c.

REFERENCE:

SD-262; Rev 2, page 11
290002K403 ..(KA's)

ANSWER: 054 (1.00)

c.

REFERENCE:

SD-304, Rev 1, page 15
262001K401 ..(KA's)

ANSWER: 055 (1.00)

c.

REFERENCE:

OI 317.1, Rev 26, page 29; SD-317.1, Rev 1, page 10
262001K301 ..(KA's)

ANSWER: 056 (1.00)

a

REFERENCE:

SD-170; Rev 2, page 10
261000A402 ..(KA's)

ANSWER: 057 (1.00)

b.

REFERENCE:

ARP 1C05A, D-6, Rev 4, page 1
214000A402 ..(KA's)

ANSWER: 058 (1.00)

a.

REFERENCE:

ARP 1C05A, D-2, Automatic Actions
215003K604 ..(KA's)

ANSWER: 059 (1.00)

c.

REFERENCE:

ARP 1C03A, C-5, Rev 3, page 2
295026G009 ..(KA's)

ANSWER: 060 (1.00)

d.

REFERENCE:

EOP 6, Attachment 3
295016A107 ..(KA's)

ANSWER: 061 (1.00)

d.

REFERENCE:

OI 518.1, Rev 30,
295019K302 ..(KA's)

ANSWER: 062 (1.00)

b.

REFERENCE:

EOP-C Def #4
295012G012 ..(KA's)

ANSWER: 063 (1.00)

d

REFERENCE:

SD-183.1; Rev 1, page 12
218000A403 ..(KA's)

ANSWER: 064 (1.00)

a

REFERENCE:

SD-644, Pev 1, pg 9
259001K301 ..(KA's)

ANSWER: 065 (1.00)

b.

REFERENCE:

ARP 1C03A, D-2; Rev 3, page 1
294001A102 ..(KA's)

ANSWER: 066 (1.00)

c

REFERENCE:

AOP 646; Rev 5, pg 3
259001A202 ..(KA's)

ANSWER: 067 (1.00)

b

REFERENCE:

Steam tables - Mollier Diagram
239002A101 ..(KA's)

ANSWER: 068 (1.00)

d.

REFERENCE:

OI 183.1, Rev 19, page 8
239002G004 ..(KA's)

ANSWER: 069 (1.00)

b.

REFERENCE:

ARP 1C08A, A-8, Rev 8, page 2
262002K603 ..(KA's)

ANSWER: 070 (1.00)

d.

REFERENCE:

OI 149; Rev 47
219000A407 ..(KA's)

ANSWER: 071 (1.00)

a.

REFERENCE:

IPOI 5, Rev 14, page 5
295006A107 ..(KA's)

ANSWER: 072 (1.00)

d

REFERENCE:

SD-856.1; Rev 1, pg 21
201002K406 ..(KA's)

ANSWER: 073 (1.00)

a.

REFERENCE:

EOP-4, "Radioactivity Release Control," Rev. 6, p. 1
295038K203 ..(KA's)

ANSWER: 074 (1.00)

c.

REFERENCE:

OI 959, "Torus Drain System," Rev. 6, pp. 4-5
TS 3.5.G.4
295030G003 ..(KA's)

ANSWER: 075 (1.00)

b.

REFERENCE:

SD-149, "Residual Heat Removal System," Rev. 2, p. 12
295024A111 ..(KA's)

ANSWER: 076 (1.00)

b.

REFERENCE:

AOP 915, Rev. 7, page 10
295016A204 ..(KA's)

ANSWER: 077 (1.00)

c.

REFERENCE:

NGD 101.01, Rev 3, page 8
294001A102 ..(KA's)

ANSWER: 078 (1.00)

b.

REFERENCE:

SD-693.2, "EHC Logic System," Rev. 1, pp. 15, 39
223002K307 ..(KA's)

ANSWER: 079 (1.00)

c.

REFERENCE:

SD-183.1, "Automatic Depressurization System," Rev. 1, pp. 12, 20
218000K501 ..(KA's)

ANSWER: 080 (1.00)

c.

REFERENCE:

OI-153 "Standby Liquid Control System," Rev. 22, p. 13
P&ID BECH-M126, "Standby Liquid Control System," Rev. 20
211000A202 ..(KA's)

ANSWER: 081 (1.00)

b.

REFERENCE:

OI-264, "Reactor Recirculation System," Rev. 39, page 15
202002A302 ..(KA's)

ANSWER: 082 (1.00)

a.

REFERENCE:

ARP 1C04C-A2, Rev 1, Section 3.3
295036K303 ..(KA's)

ANSWER: 083 (1.00)

a.

REFERENCE:

EOP-2 Rev 5, Section PC/P-3&4
226001A407 ..(KA's)

ANSWER: 084 (1.00)

c.

REFERENCE:

SD 959.1, Rev 1, page 23
239001K201 ..(KA's)

ANSWER: 085 (1.00)

a.

REFERENCE:

ARP 1C05A A-6, A CRD PUMP 1P-209A TRIP OR MOTOR OVERLOAD, Rev. 2,
page 3
201003K601 ..(KA's)

ANSWER: 086 (1.00)

c.

REFERENCE:

1408.16, "Heat Stress Control," Rev 2, page 3
294001K108 ..(KA's)

ANSWER: 087 (1.00)

b.

REFERENCE:

ACP 1411.22, Rev 3, page 7
294001K103 ..(KA's)

ANSWER: 088 (1.00)

b.

REFERENCE:

ACP 1406.10, Rev 2, page 5
294001A104 ..(KA's)

ANSWER: 089 (1.00)

b.

REFERENCE:

ARP 1C22, B-1 Rev 2
294001K115 ..(KA's)

ANSWER: 090 (1.00)

a.

REFERENCE:

IPOI 7, Rev 40, page 8
294001K101 ..(KA's)

ANSWER: 091 (1.00)

c.

REFERENCE:

ARP 1C03A D-2, "Post Treat RM-4101A/B Downscale," Rev. 3, p. 1
294001A109 ..(KA's)

ANSWER: 092 (1.00)

a.

REFERENCE:

ACP 1411.22, Rev 3, page 4
294001K103 ..(KA's)

ANSWER: 093 (1.00)

d.

REFERENCE:

Standard Dose Rate Calculation from 10CFR20.
294001K104 ..(KA's)

ANSWER: 094 (1.00)

a

REFERENCE:

ACP 1411.11, Rev 5, pg 16, steps 6 & 8
294001K114 ..(KA's)

ANSWER: 095 (1.00)

c.

REFERENCE:

ACP 1410.5, Rev 17, page 19; IPOI 7, Rev 40, page 28
294001K102 ..(KA's)

ANSWER: 096 (1.00)

d.

REFERENCE:

ACP 1413.4, Rev 10, page 4.
294001K105 ..(KA's)

ANSWER: 097 (1.00)

b

REFERENCE:

Technical Specification Revision 206, Section 3.6.F.1, page 3.6-11
202002K405 ..(KA's)

ANSWER: 098 (1.00)

a.

REFERENCE:

System Description 152, Rev 1, page 34
206000K201 ..(KA's)

ANSWER: 099 (1.00)

d.

REFERENCE:

AOP-915, Rev 7
226001G009 ..(KA's)

ANSWER: 100 (1.00)

d.

REFERENCE:

ARP 1C23A D-4, Rev. 0, p. 1
288000K304 ..(KA's)

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

A N S W E R K E Y

MULTIPLE CHOICE

001	d	023	d
002	d	024	c
003	b	025	c
004	c	026	b
005	a	027	a
006	d	028	b
007	c	029	c
008	a	030	a
009	a	031	c
010	c	032	c
011	d	033	c
012	d	034	b
013	d	035	c
014	b	036	c
015	d	037	b
016	d	038	d
017	a	039	a
018	d	040	a <i>red 4/9/90</i>
019	d	041	b
020	c	042	b
021	b	043	c
022	d	044	d
		045	d

A N S W E R K E Y

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

A N S W E R K E Y

- 092 a
- 093 d
- 094 a
- 095 c
- 096 d
- 097 b
- 098 a
- 099 d
- 100 d

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