APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Operator Licensing Exam Report: 50-368/OL88-01 Operating License: NPF-6

Docket No: 50-368

Licensee: Arkansas Power & Light Company
P.O. Box 551
Little Rock, Arkansas 72203

Facility Name: Arkansas Nuclear One, Unit 2 (ANO2)

Examination at: ANO2

Chief Examiner: John L Pellet FOR 5/10/88
D. N. Graves, Examiner, Date
Operator Licensing Section,
Division of Reactor Safety

Approved by: John L Pellet 5/10/88
J. L. Pellet, Section Chief, Date
Operator Licensing Section,
Division of Reactor Safety

Summary

NRC Administered Examinations Conducted During the Week of April 18, 1988 (Report 50-368/OL88-01)

NRC administered examinations to six (6) candidates. All candidates passed all portions of the examination and will be issued the appropriate license.

DETAILS

1. Persons Examined

	SRO
License Examinations:	Pass - 6 Fail - 0

2. Examiners

D. Graves, Chief Examiner
L. Defferding
R. Gruel

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 these results are not subject to public disclosure.

a. Examination Review Comment/Resolution

In general, editorial comments or changes made during the examination, or subsequent grading reviews are not addressed by this resolution section. This section reflects resolution of substantive comments made by ANO2. Both comments generated by the facility review of the written examination have been incorporated into the master examination key which is included in this report. The full text of the comments is attached.

b. Site Visit Summary

(1) At the end of the written examination administration, the facility licensee was provided a copy of the examination and answer key for the purpose of commenting on the examination content validity. It was explained to the facility licensee that regional policy was to have examination results finalized within 30 days. Thus, a timely response was desired to attain this goal.

(2) At the conclusion of the site visit, the Chief Examiner met with facility representatives to discuss the visit. The following personnel were present:

NRC	Facility
D. Graves	P. Crossland
L. Defferding	E. Ewing III
	E. Force
	D. Johnson
	W. Perks
	J. Vandergrift

Mr. Graves opened the meeting by thanking those present for the cooperation received during the site visit and informing those present that current guidelines do not allow the disclosure of preliminary operating examination results. Other items discussed were as follows:

1. All items that are listed on the Simulation Facility Fidelity Report (included in this report).

2. Mr. Force asked if the Region would consider using facility generated simulator scenarios during the simulator portion of the operating examination. Mr. Graves responded that the scenarios would be considered for incorporation into the examination process, just as is written examination question bank. The scenarios would have to meet the examination requirements of NUREG 1021, Operator Licensing Examiner Standards, and would have to be diverse and numerous enough that candidate recognition of a given scenario would not be likely.

3. Mr. Johnson felt that the examiners did not allow enough time to setup out-of-service equipment properly prior to the start of the scenarios. Mr. Graves responded that it was not the examiners' intention to hurry the simulator operator in setting up his initial conditions and would allow the operator the necessary time to place equipment out of service.

c. Generic Comments

No areas of knowledge were identified as being generically weak.

d. Master Examination and Answer Key

A copy of the final ANO2 license examination and answer key is attached. The facility licensee comments have been incorporated into the answer key.

e. Facility Examination Review Comments

The facility licensee comments regarding the written examination are attached.

f. Simulation Facility Fidelity Report

All items on the attached Fidelity Report have been discussed with the facility and Discrepancy Reports (DR) have been generated.

U. S. NUCLEAR REGULATORY COMMISSION
SENIOR REACTOR OPERATOR LICENSE EXAMINATION

FACILITY: ARKANSAS NUCLEAR ONE-2

REACTOR TYPE: PWR-CE

DATE ADMINISTERED: 88/04/18

EXAMINER: GRAVES, D.

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:

Use separate paper for the answers. Write answers on one side only. Staple question sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires at least 70% in each category and a final grade of at least 80%. Examination papers will be picked up six (6) hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE		CATEGORY
25.00	25.00	_____	_____	5.	THEORY OF NUCLEAR POWER PLANT OPERATION, FLUIDS, AND THERMODYNAMICS
25.00	25.00	_____	_____	6.	PLANT SYSTEMS DESIGN, CONTROL, AND INSTRUMENTATION
25.00	25.00	_____	_____	7.	PROCEDURES - NORMAL, ABNORMAL, EMERGENCY AND RADIOLOGICAL CONTROL
25.00	25.00	_____	_____	8.	ADMINISTRATIVE PROCEDURES, CONDITIONS, AND LIMITATIONS
100.00		_____ Final Grade	_____%		Totals

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

_____
Candidate's Signature

QUESTION 5.01 (2.50)

True or False:

a. It will take less time for the reactor to go from 2% to 4% power than from 25% to 50% power if the period is constant.

b. Halving the period will double the Start Up Rate.

c. If reactor power is increased from 1% at a stable SUR of 0.5 DPM, power will be 5%. in one minute.

d. If a positive reactivity addition to a just critical reactor results in a 100 sec. period, the same amount of negative reactivity addition will result in a 100 second negative period.

e. If a shutdown reactor is started up from a 10 CPS count rate, criticality should be expected at a count rate between 2000 and 2500 CPS. (2.5)

ANSWER 5.01 (2.50)

a. False
b. True
c. False
d. False
e. False
[0.5 ea.]

REFERENCE
ANO2 PSRT, Pp. 129 - 148
192003K109 2.3/2.3
192003K109 ...(KA'S)

(***** CATEGORY 05 CONTINUED ON NEXT PAGE *****)

QUESTION 5.02 (1.00)

Concerning equilibrium Samarium-149 (Sm) reactivity, which of the following statements is correct? 50% equilibrium Sm reactivity is: (1.0)

a. one-quarter of 100% equilibrium Sm reactivity.

b. one-half of 100% equilibrium Sm reactivity.

c. three-quarters of 100% equilibrium Sm reactivity.

d. equal to 100% equilibrium Sm reactivity.

ANSWER 5.02 (1.00)

d (1.0)

REFERENCE
Unit 2 PSRT, P. 207
192006K115 1.9*/1.9*
192006K115 ...(KA'S)

QUESTION 5.03 (1.00)

Choose the correct response.

The preferred method for dampening a Xenon oscillation is to initially:

a. Insert control rods into a low flux area.

b. Insert control rods into a high flux area.

c. Withdraw control rods from a low flux area.

d. Withdraw control rods from a high flux area. (1.0)

ANSWER 5.03 (1.00)

b (1.0)

REFERENCE
Unit 2 PSRT, P. 206
192006K114 3.2/3.2

U. S. NUCLEAR REGULATORY COMMISSION
SENIOR REACTOR OPERATOR LICENSE EXAMINATION

FACILITY: ARKANSAS NUCLEAR ONE-2

REACTOR TYPE: PWR-CE

DATE ADMINISTERED: 88/04/18

EXAMINER: GRAVES, D.

CANDIDATE: _____

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25.00	25.00	_____	_____	8.	ADMINISTRATIVE PROCEDURES, CONDITIONS, AND LIMITATIONS
100.00		_____ Final Grade	_____%		Totals

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b. Halving the period will double the Start Up Rate.

c. If reactor power is increased from 1% at a stable SUR of 0.5 DPM, power will be 5%. in one minute.

d. If a positive reactivity addition to a just critical reactor results in a 100 sec. period, the same amount of negative reactivity addition will result in a 100 second negative period.

e. If a shutdown reactor is started up from a 10 CPS count rate, criticality should be expected at a count rate between 2000 and 2500 CPS. (2.5)

ANSWER 5.01 (2.50)

a. False
b. True
c. False
d. False
e. False
[0.5 ea.]

REFERENCE
ANO2 PSRT, Pp. 129 - 148
192003K109 2.3/2.3
192003K109 ...(KA'S)

(***** CATEGORY 05 CONTINUED ON NEXT PAGE *****)

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d. equal to 100% equilibrium Sm reactivity.

ANSWER 5.02 (1.00)

d (1.0)

REFERENCE
Unit 2 PSRT, P. 207
192006K115 1.9*/1.9*
192006K115 ...(KA'S)

QUESTION 5.03 (1.00)

Choose the correct response.

The preferred method for dampening a Xenon oscillation is to initially:

a. Insert control rods into a low flux area.

b. Insert control rods into a high flux area.

c. Withdraw control rods from a low flux area.

d. Withdraw control rods from a high flux area. (1.0)

ANSWER 5.03 (1.00)

b (1.0)

REFERENCE
Unit 2 PSRT, P. 206
192006K114 3.2/3.2

192006K114 ...(KA'S)

QUESTION 5.04 (1.00)

Why will a positive reactivity insertion at End of Core Life (EOL) cause a greater reactor Startup Rate (SUR) response than the same positive reactivity insertion at Beginning of Core Life (BOL)? (1.0)

ANSWER 5.04 (1.00)

At EOL the delayed neutron fraction (Beta) is smaller (1.0).

REFERENCE
Unit 2 Plant Specific Reactor Theory, pg 138
192003K107 3.0/3.0
192003K107 ...(KA'S)

QUESTION 5.05 (2.00)

You have just completed a reactor startup and power level is above the point of adding heat (POAH). In the following situations, EXPLAIN in terms of Reactivity Coefficients, why the Reactor Power changes? (2.0)

(Assume the core is at mid-life, no other operator action, and treat each situation separately).

a. The Steam Dump pressure setting is raised by 20 psig resulting in a lower final Reactor power.

b. A 1% steam leak develops outside of containment resulting in a higher final Reactor power.

ANSWER 5.05 (2.00)

a. The steam dump pressure setting increase causes an RCS temperature increase (0.5). MTC (0.25) and FTC (Doppler) (0.25) both add negative reactivity to lower reactor power.

b. The increased flow will result in a lower RCS temperature (0.5). MTC (0.5) will add positive reactivity and power will rise.

REFERENCE
Unit Plant Specific Reactor Theory, chapter 17
192008K117 3.3/3.4

192008K121 3.6/3.8
192008K121 192008K117 ...(KA'S)

QUESTION 5.06 (2.00)

For each of the factors listed below, does the magnitude of the negative Power Coefficient increase or decrease as the factor is changed in the direction described? (2.0)

a. Moderator temperature decreases

b. Core age increases

c. Boron concentration increases

d. Control rods inserted

ANSWER 5.06 (2.00)

a. Decrease (0.5)
b. Increase (0.5)
c. Decrease (0.5)
d. Increase (0.5)

REFERENCE
Unit 2 Plant Specific Reactor Theory, pg 194-197
192004K113 2.9/2.9
192004K113 ...(KA'S)

(***** CATEGORY 05 CONTINUED ON NEXT PAGE *****)

QUESTION 5.07 (1.00)

As a subcritical reactor nears criticality, the length of time to reach equilibrium count rate after an insertion of a given fixed amount of positive reactivity... (1.0)

(SELECT THE ONE CORRECT ANSWER)

a. increases because of a larger number of neutron life cycles required to reach equilibrium.

b. increases primarily because of the increased population of delayed neutrons in the core.

c. decreases primarily because of the increased population of delayed neutrons in the core.

d. decreases because the source neutrons are becoming less important in relation to total neutron population.

ANSWER 5.07 (1.00)

a (1.0)

REFERENCE
Unit 1 Plant Specific Reactor Theory, pg 157
192008K104 3.8/3.8
192008K104 ...(KA'S)

QUESTION 5.08 (1.00)

Why does Boron Worth decrease with increasing coolant temperature? (1.0)

ANSWER 5.08 (1.00)

Boron worth decreases with increasing moderator temperature because of the decrease in moderator density (1.0) (displaces boron out of the core - at a given ppm there will be more pounds of boron in the core when the system is cold than when hot).

REFERENCE
Unit 2 Plant Specific Reactor Theory, pg 198
192004K110 2.9/2.9

192004K110 ...(KA'S)

QUESTION 5.09 (1.00)

The Xenon peak that occurs after a reactor trip from 100% equilibrium Xenon condition is greater than the peak for a trip from 50% power because:

(Complete the statement by selecting the correct response from the choices listed below) (1.0)

a. The fission yield for Xenon is higher at 100% power.

b. There are more thermal neutrons in the core at 100% power.

c. There is more Iodine in the core at the time of the trip from 100% power.

d. There are more delayed neutrons in the core at 100% power.

ANSWER 5.09 (1.00)

c (1.0)

REFERENCE
Unit 2 Plant Specific Reactor Theory, pg 205
192006K102 3.0/3.1
192006K102 ...(KA'S)

QUESTION 5.10 (2.00)

Given two reactor startups with identical plant conditions. One is performed using a continuous CEA withdrawal and the other is performed using a pull and wait method.

a. Which would go critical first AND why? (1.0)

b. Which would have the highest count rate at criticality and why? (1.0)

ANSWER 5.10 (2.00)

a. The continuous rod withdrawal startup (0.5) because the required reactivity to take the reactor critical will be inserted first (0.5).

b. The Pull and Wait startup will have the highest count rate (0.5) at criticality due to subcritical multiplication accounting for a higher equilibrium value (0.5) which the continuous pull startup does not have an opportunity to do.

REFERENCE
Unit 2 Plant Specific Reactor Theory, Chapter 15
192003K101 2.7/2.8
192003K101 ...(KA'S)

QUESTION 5.11 (1.50)

What steam generator pressure is required to maintain 200 deg's F subcooling margin in the RCS when RCS pressure is 595 psig. Show all work. (1.5)

ANSWER 5.11 (1.50)

1. Add 15 psi to 595 psig = 610 psia (0.25)

2. Using steam tables, @ 610 psia, Tsat = 488 +/- 2 deg's F (0.5)

3. Tsat in S/G = Trcs - Tsubcooling = 488 - 200 = 288 +/- 2 deg's F (0.25)

4. Using steam tables, Psat @ Tsat = 288 deg's F = 56 +/- 4 psia (0.5)

REFERENCE
Steam Tables
193003K125 3.3/3.4
193003K125 ...(KA'S)

(***** CATEGORY 05 CONTINUED ON NEXT PAGE *****)

QUESTION 5.12 (1.00)

The equation Q = m (h2 - h1) is used to perform the calorimetric calculation of Reactor Thermal Power. Based on this calculation the power range nuclear instruments are adjusted to read in percent rated power. If the heat input from the Reactor Coolant pumps were neglected in the calculation, how would indicated power from the power range nuclear instruments differ from actual thermal power? (1.0)

ANSWER 5.12 (1.00)

The nuclear instrumentation would indicate higher than the actual thermal power. (1.0)

REFERENCE
ANO HT, Thermodynamics, Fluid Handbook, pg 193 - 195
193007K108 3.1/3.4
193007K108 ...(KA'S)

QUESTION 5.13 (2.00)

Regarding Nucleate Boiling:

a. What are the FOUR Reactor Coolant System parameters that the DNB Heat Flux (CHF) is dependent upon? (1.0)

b. Where in the core (axially) is the DNBR the largest and why? Assume normal operating conditions. (1.0)

ANSWER 5.13 (2.00)

a. Flow
Temperature
Pressure
Power [0.25 each]

b. Toward the bottom of the core (0.5) because this is where the temperature is the lowest and pressure the highest (0.5).

REFERENCE
ANO HT, Thermodynamics, Fluids handbook, chapter 8
193008K105 3.4/3.6

193008K105 ...(KA'S)

QUESTION 5.14 (1.50)

What Reactor Coolant System chemistry parameters are controlled by the following additives? (1.5)

a. Hydrazine

b. Hydrogen

c. Lithium Hydroxide

ANSWER 5.14 (1.50)

a. Hydrazine controls Oxygen concentration (0.5)

b. Hydrogen controls Oxygen concentration (0.5)

c. Lithium Hydroxide is used to control RCS pH. (0.5)

REFERENCE
AA-52002-022 pg 6, 7
194001A114 2.5*/2.9
194001A114 ...(KA'S)

QUESTION 5.15 (3.00)

The reactor is operating at 100% power. STATE the INITIAL effect that each of the following will have (INCREASE, DECREASE, NO EFFECT) on fuel center-line temperature and BRIEFLY JUSTIFY your answer.

a. Decrease in reactor coolant flow (1.0)

b. Increase in RCS pressure (1.0)

c. Decreasing fuel/cladding gap thickness (1.0)

ANSWER 5.15 (3.00)

a. Increase [0.5]. Q is proportional to the mass flowrate, so as flow decreases moderator and therefore fuel must heat up [0.5].

b. No effect [0.5]. Subcooled heat transfer is not affected by pressure changes [0.5].

c. Decrease [0.5]. Q is proportional to delta-T/L (gap width) --> delta-T is proportional to QL, so as L decreases, delta-T (and fuel center-line temperature) decreases [0.5].

REFERENCE
ANO HT, Thermodynamics, Fluids Handbook, chapter 8
193008K116 2.4/2.6
193008K116 ...(KA'S)

QUESTION 5.16 (1.50)

For each of the following concerning centrifugal pump operation, STATE whether available NPSH INCREASES, DECREASES or REMAINS THE SAME. Consider each item separately.

a. Suction temperature is reduced. (0.5)

b. Discharge valve is closed slightly. (0.5)

c. Suction valve is closed slightly. (0.5)

ANSWER 5.16 (1.50)

a. increases [0.5]
b. increases [0.5]
c. decreases [0.5]

REFERENCE
ANO HT, Thermodynamics, Fluids Handbook, pg 144
191004K106 3.2/3.3
191004K106 ...(KA'S)

(***** END OF CATEGORY 05 *****)

QUESTION 6.01 (3.50)

a. List three (3) suction sources for the Emergency Feedwater System, including when each would be utilized. (1.5)

b. When starting the EFW pumps manually (non-auto starts), why should the turbine driven pump be allowed to accelerate to full speed prior to starting the motor driven pump? (1.0)

c. How is pump minimum flow verified with the EFW pumps running even though the steam generators are not being fed? (1.0)

ANSWER 6.01 (3.50)

a. The condensate storage tank (0.25) is normally aligned as the suction source when above 10% power (0.25). When below 10% power (0.25), the CST and the Startup and Blowdown Demineralizer effluent (0.25) are both lined up. The Service Water System (0.25) is utilized if a EFAS signal is present (0.125) and low suction pressure exists (0.125).

b. To prevent drawing suction pressure excessively low (1.0) which could cause the turbine driven pump to overspeed and trip.

c. EFP recirculation flows are included in the indicated flows to the steam generators so those flow indicators should be utilized (1.0).

REFERENCE
AA-42002-021, Emergency Feedwater, pg 2, 17
061000K105 2.6*/2.8* 061000K107 3.6/3.8 061000K401 3.9/4.2
061000A301 4.2/4.2 061000K408 2.7/2.9 061000A204 3.4/3.8
061000K105 061000A204 061000K401 061000K107 061000A301
061000K408 ...(KA'S)

QUESTION 6.02 (2.50)

List the automatic actions that occur as a result of a RAS. (2.5)

ANSWER 6.02 (2.50)

- LPSI pumps trip
- Containment sump recirc line isolation valves open
- Minimum flow line isolation valves close
- RWT isolation valves close
- Service water supply valve to containment spray cooler (Shutdown Cooling Heat Exchanger) opens

(5 at 0.5 each)

REFERENCE
AA-52002-004, Emergency Core Cooling, pg 10
006020A402 3.9/3.8
006020A402 ...(KA'S)

QUESTION 6.03 (1.50)

During normal power operation, the two temperature sensing elements on the outlet of the letdown heat exchanger fail HIGH. What control function(s) occur(s) as a result. (1.5)

ANSWER 6.03 (1.50)

- CCW flow controller valve from the letdown heat exchanger goes full open.
- Letdown flow to the CVCS rad monitors and boronometer is isolated.
- Bypasses letdown flow around the demineralizers to the VCT.

(3 at 0.5 each)

REFERENCE
AA-42002-003, CVCS, pgs 4, 5
004020K404 2.6/3.0 008000K102 3.3/3.4
004020K404 008000K102 ...(KA'S)

(***** CATEGORY 06 CONTINUED ON NEXT PAGE *****)

QUESTION 6.04 (3.00)

a. An Emergency Diesel Generator is running (manual start) and the "governor" handswitch and the "voltage" control handswitch are taken to RAISE or INCREASE. What effect does this have on the machine if: (2.0)

1. The EDG is paralleled with another source on the grid (output breaker shut)

2. The EDG output breaker is open

b. If the EDG has automatically started, what are two (2) ways in which the machine may be shut down? (1.0)

ANSWER 6.04 (3.00)

a. 1. Kw increases (0.5) and reactive load increases (0.5)

2. EDG speed, or frequency, increases (0.5) and output voltage increases (0.5)

b. - Placing the local AUTO-LOCKOUT-START switch to LOCKOUT
- Pushing the Emergency Manual Stop PB on the engine
- Tripping the fuel racks
(2 at 0.5 each)

REFERENCE
ANO Procedure 2104.36
064000A401 4.0/4.3 064000A402 3.3/3.4
064000A401 064000A402 ...(KA'S)

QUESTION 6.05 (1.50)

"A" CCW pump is serving Loop 1 CCW, "C" CCW pump is serving Loop 2, and "B" CCW pump is NORMAL AFTER START. "C" CCW pump fails (shaft breaks). Describe the response of the CCW system. Start the response with discharge pressure on "C" pump decreasing. (1.5)

ANSWER 6.05 (1.50)

When C pump discharge is <88 psig (0.5), B CCW pump's crossover valves open (0.5), B CCW pump starts (0.5), supplying Loop 2.

REFERENCE
AA-52002-030, Cooling Water, Table 30.1
ANO2 Question Bank 202-AA-52002-030-3G
008000A201 3.3/3.6
008000A201 ...(KA'S)

QUESTION 6.06 (1.50)

For the following situations, indicate whether a reactor trip will occur:

a. High Linear Power trip in channel A and low DNBR trip in channel D

b. "A" CEDM MG set trips with the synchronizing circuit breaker open

c. High LPD trip in channel B and CPC channel C fails (loses power)

ANSWER 6.06 (1.50)

a. no
b. no
c. yes
(0.5 each)

REFERENCE
ANO2 Question Bank AA-52002-006-7D
012000K401 3.7/4.0 012000K403 2.3/2.7* 012000K103 3.7/3.8
012000K103 012000K401 012000K403 ...(KA'S)

(***** CATEGORY 06 CONTINUED ON NEXT PAGE *****)

QUESTION 6.07 (1.00)

In which area listed below (a - d) will void formation have the greatest effect on neutron leakage as detected by the Source Range Nuclear Instrumentation during an accident? (1.0)

a. core

b. vessel downcomer

c. vessel head

d. RCS loops

ANSWER 6.07 (1.00)

b (1.0)

REFERENCE
AA-62012-003
015020A202 3.3/3.8
015020A202 ...(KA'S)

QUESTION 6.08 (2.00)

What are the four (4) functions/interlocks provided in the CPCs and PPS by the 1.0E-4% bistable in the log safety channel? (2.0)

ANSWER 6.08 (2.00)

When above 1.0E-4% (0.2):
- allows the operator to bypass the high log power trip (0.4)
- inserts (removes the bypass) the LPD/DNBR trips (0.4)

When below 1.0E-4% (0.2):
- Allows the operator to bypass the CPC (LPD/DNBR) trips (0.4)
- inserts the high log power trip (0.4)

REFERENCE
AA-52002-014, Nuclear Instrumentation
015000K406 3.9/4.2 015000K407 3.7/3.8
015000K406 015000K407 ...(KA'S)

(***** CATEGORY 06 CONTINUED ON NEXT PAGE *****)

QUESTION 6.09 (1.50)

Match the plant area (a - f) with the type of fire water system available in that area (1 - 3). (1.5)

a.	Containment	1.	Wet pipe sprinkler
b.	Cable spreading rooms	2.	Pre-action sprinkler
c.	Chemistry lab	3.	Deluge
d.	Switch gear transformers		
e.	Diesel generator rooms		
f.	Secondary sample room		

ANSWER 6.09 (1.50)

a. 2
b. 3
c. 1
d. 3
e. 2
f. 1
(0.25 each)

REFERENCE
AA-52002-021, pg 4, 5
0860006004 3.1/3.3
0860006004 ...(KA'S)

(***** CATEGORY 06 CONTINUED ON NEXT PAGE *****)

QUESTION 6.10 (3.00)

For each of the following conditions (a - c) LIST those actuation signals and trips (1 - 8) that should have automatically occurred. CONSIDER each condition separately. Each condition may have more than one answer from the list of actuation signals or trips. (3.0)

1. SIAS
2. CSAS
3. RAS
4. MSIS
5. CIAS
6. EFAS
7. CCAS
8. none

a. A steam line break has occurred in containment and

containment pressure = 7 psig
containment radiation = normal background
S/G levels = A: 60% B: 50%
Pzr pressure = 1800 psig
S/G pressures = A: 700 psig B: 650 psig
RWST level = 93%

b. A LOCA has occurred and

containment pressure = 25 psig
containment radiation = 6 R/hr
S/G levels = A: 38% B: 38%
Pzr pressure = 1300 psig
S/G pressures = A: 380 psig B: 450 psig
RWST level = 5%

c. A feedwater problem has occurred

containment pressure = 1 psig
containment radiation = normal background
S/G levels = A: 63% B: 39%
Pzr pressure = 2180 psia
S/G pressures = A: 900 psig B: 910 psig
RWST level = 85%

QUESTION 7.01 (.50)

TRUE or FALSE. Activation of the Emergency Plan supersedes the use of other plant procedures. (0.5)

ANSWER 7.01 (.50)

False (0.5).

REFERENCE
ANO 1903.10
194001A116 3.1/4.4*
194001A116 ...(KA'S)

QUESTION 7.02 (1.00)

According to the EOP/Tech Guide, during an Inadequate Core Cooling (ICC) event, there is a preference for which systems/components should be used for restoration of feedwater flow. List three (3) systems or components in their preferred order. (1.0)

ANSWER 7.02 (1.00)

1. Emergency feedwater
2. Main feedwater pump
3. Condensate pump

(0.25 for each component, 0.25 for order)

REFERENCE
ANO2 2202.01, EOP Tech Guide
0000746012 4.3*/4.4*
0000746012 ...(KA'S)

QUESTION 7.03 (2.00)

List the four (4) basic entry conditions into 2202.01, Emergency Operating Procedure. Values are NOT required. (2.0)

ANSWER 7.03 (2.00)

- Any automatic reactor trip
- A manual reactor trip due to a failure of the RPS to function upon reaching the appropriate setpoint.
- A manual reactor trip due to the occurrence of any malfunction or event which, in the opinion of the operator, is necessary to protect the plant equipment or personnel.
- If the reactor has not tripped and indications of a S/G tube rupture greater than Tech. Spec. limits are present.

(4 at 0.5 each)

REFERENCE
ANO2 EOPs, 2202.01, Rev 3, pg 1
000007G011 4.1*/4.3*
000007G011 ...(KA'S)

QUESTION 7.04 (3.50)

List the seven (7) safety functions having immediate action verifications in the EOPs. (3.5)

ANSWER 7.04 (3.50)

- Reactivity Control
- Electrical Power
- RCS Pressure Control
- RCS Inventory Control
- RCS Heat Removal
- Core Heat Removal
- Containment Integrity

(7 at 0.5 each)

REFERENCE
ANO2 EOPs, 2202.01, Rev 3, pg 2
194001A102 4.1*/3.9
194001A102 ...(KA'S)

QUESTION 7.05 (1.00)

Where should one look to find a list of SIAS actuated components for post actuation verification? (1.0)

ANSWER 7.05 (1.00)

Appendix to EOP 2202.01

REFERENCE
ANO2 EOPs
006020A301 4.2/4.3
006020A302 3.9/4.2
006020A301 006020A302 ...(KA'S)

QUESTION 7.06 (1.00)

During rapid power changes (ramp rates in excess of 30% per hour), which indications should be used for monitoring ASI and WHY not the normal steady state monitoring method? (1.0)

ANSWER 7.06 (1.00)

The CPC indications should be used for monitoring ASI (0.5) due to the slow response time of the Rhodium incore detectors (0.5).

REFERENCE
ANO2 2102.04, Power Operation, Rev 11, pg 4
012000K607 2.9*/3.2*
012000K608 3.6*/3.7*
012000K607 012000K608 ...(KA'S)

QUESTION 7.07 (2.00)

a. What three (3) conditions allow the use of the Reactor Trip Recovery procedure, 2102.06? (1.5)

b. Whose authorization, as a minimum, is required for conducting the restart? (0.5)

ANSWER 7.07 (2.00)

a. 1. The cause of the trip is known and is or will be corrected (0.5).

2. The trip did not result from failures of any safety related systems such that a related reportable occurrence occurred (0.5).

3. A cooldown is not required (0.5).

b. Operations Superintendent (0.5) or designee

REFERENCE
ANO2 2102.06, Reactor Trip Recovery, Rev 9, pg 1, 3
194001A102 4.1*/3.9
194001A102 ...(KA'S)

QUESTION 7.08 (3.00)

a. Section I of Abnormal Procedure 2203.14, Alternate Shutdown, deals with actions taken during a control room evacuation. What is the minimum number of operators required to perform these actions, AND what function does each have with regard to general responsibility during this event? (2.0)

b. If a fire in the Unit 1 control room causes them to implement an alternate shutdown, what action(s) should be taken in Unit 2 (assume the Unit 2 control room remains habitable)? (1.0)

ANSWER 7.08 (3.00)

a. 6 minimum (0.5)
SS to the TSC (0.5)
SRO and 2 ROs out in the plant (0.5)
Aux operator and waste control operator to the fire brigade (0.5)

b. Begin an immediate plant shutdown (0.5) at the maximum safe rate (0.5).

REFERENCE
ANO2 AOP 2203.14, Alternate Shutdown, Rev 24, pgs 2, 6
0000686010 4.1*/4.2*
0000686010 ...(KA'S)

(***** CATEGORY 07 CONTINUED ON NEXT PAGE *****)

QUESTION 7.09 (3.00)

a. Explain the two major concerns involving an inadvertent actuation of SIAS and RAS simultaneously? (2.0)

b. If the actuations are determined to be invalid, what two (2) verifications should be made prior to securing the SIAS? (1.0)

ANSWER 7.09 (3.00)

a. 1. HPSI pumps' recirculation valves shut (0.5) and the pumps will eventually overheat and may be permanently damaged (0.5).

2. The RWT will gravity drain to the containment sump (0.5) during the time the suctions are shifting. Concerned about loss of RWT water (0.25) and adequate pump suction pressure (0.25).

b. - >30 degree F margin to saturation (0.5)
- secondary decay heat removal (0.5)

REFERENCE
AN02 AOP 2203.18, Inadvertent Safety Injection Actuation, Rev 0, pg 1, 3
006050A201 3.9/4.2
006050A201 ...(KA'S)

QUESTION 7.10 (3.00)

a. What three (3) conditions require emergency boration per AOP 2203.32, Emergency Boration? (1.5)

b. What are three (3) methods of aligning high concentration boron to the charging pump suction in the above procedure? (1.5)

ANSWER 7.10 (3.00)

a. - CEAs inserted below the Transient Insertion limit
- Shutdown Margin in Modes 3, 4, 5, 6 less than required
- Boron concentration during refueling operations <1731 ppm
(0.5 each)

b. - BAMT gravity feed (0.5) 2CV-4920-1 or 2CV-4921-1
- RWT (0.5) 2CV-4950-2
- Boric Acid Makeup Pumps (0.5)
Valve or pump numbers not required

REFERENCE
ANO2 AOP 2203.32, Emergency Boration, Rev 2, pg 1
000024K301 4.1/4.4
000024K302 4.2/4.4
000024K302 000024K301 ...(KA'S)

QUESTION 7.11 (1.00)

TRUE or FALSE

a. During refueling (core alterations), all shutdown cooling may be stopped for up to 1 hour per 8 hour period. (0.5)

b. Fuel handling operations may continue if continuous voice communications between the reactor fueling area and the fuel storage area are lost provided restoration of the lost communication is being pursued. (0.5)

ANSWER 7.11 (1.00)

a. true (0.5)

b. false (0.5)

REFERENCE
ANO2 2502.01, Refueling Shuffle, Rev 16, pg 16, 17
034000K001 2.3/2.9
034000K001 ...(KA'S)

(***** CATEGORY 07 CONTINUED ON NEXT PAGE *****)

QUESTION 7.12 (1.50)

a. List three (3) different modes of tritium (1H3) production at a commercial nuclear power plant. (0.75)

b. Other than the fact that it is radioactive, list three (3) reasons tritium is a hazard to personnel. (0.75)

ANSWER 7.12 (1.50)

a. 1. Ternary fission
2. Boron activation
3. Lithium activation
4. Deuterium reaction
(3 at 0.25 each)

b. 1. Long half life
2. Easily absorbed through skin or clothing
3. Reacts chemically the same as hydrogen
(0.25 each)

REFERENCE
AA-52009-001
ANO2 Question Bank
194001K103 2.8/3.4
194001K103 ...(KA'S)

(***** CATEGORY 07 CONTINUED ON NEXT PAGE *****)

QUESTION 7.13 (2.50)

A condition arises which requires entry into a high radiation area. The operator entering the area will receive a whole body dose of 40 mrem. The personnel listed below, with their related personal information, are available to do the work. Each candidate is technically competent and physically capable of performing the task. Emergency limits do not apply and time constraints do not permit obtaining authorization for an exposure limit increase. Which candidate(s) have acceptable exposure margins to perform the task? Indicate the reason(s) for rejecting a candidate for the job, if applicable. (2.5)

NOTE: Each exposure below (qtr, yr, life, etc.) includes the exposure above it. Assume the current quarter is the fourth calendar quarter. All exposures are in mrem.

Candidate	1	2	3	4
Sex	male	male	female	male
Age	27	38	24	20
Today's exposure	50	10	10	20
Wkly exposure	90	150	90	250
Qtr exposure	1220	600	90	1230
Yr exposure	2200	2995	210	2810
Life exposure	-	54730	5200	9770
Remarks	history unavailable	-	4 months pregnant	-

ANSWER 7.13 (2.50)

Candidate #1: Rejected (0.25). Will exceed 100 mrem/wk (0.25) and will exceed 1250 mrem/qtr (0.25).

Candidate #2: Acceptable (0.5)

Candidate #3: Rejected (0.25). Will exceed 125 mrem/qtr (0.5).

Candidate #4: Acceptable (0.5)

REFERENCE
ANO 1000.31, Radiation Protection Manual, Rev 5, pg 37, 38
194001K103 2.8/3.4
194001K103 ...(KA'S)

(***** END OF CATEGORY 07 *****)

QUESTION 8.01 (3.00)

a. What action must be taken, and in what time frame, if the unit is operating with the minimum shift crew composition and one of the Reactor Operators becomes ill? (0.5)

b. How long may the shift crew remain below the minimum composition and what action must be taken if this time is exceeded? (1.5)

c. Fifteen minutes before the scheduled arrival of the on-coming shift, one of the three on-coming ROs calls in sick and says he will not be coming in. The Shift Supervisor decides to call in another operator due to the overtime status of his own shift. He also decides that since the relief operator should arrive shortly after shift change (approximately 30 minutes) that his shift can go home and let the on-coming shift start with two ROs. Were his decisions correct? JUSTIFY your answer. Assume the plant is operating in Mode 1. (1.0)

ANSWER 8.01 (3.00)

a. Immediately (0.25) attempt to restore minimum crew composition (0.25) such as call in replacement operators.

b. 2 hours (0.5). Place the plant in a mode where the minimum crew composition is met (1.0).

c. Decisions were correct (0.5). Minimum crew composition was met without calling in the additional operator (0.5).

REFERENCE
ANO2 Technical Specification, Table 6.2-1
194001A103 2.5/3.4
194001A103 ...(KA'S)

(***** CATEGORY 08 CONTINUED ON NEXT PAGE *****)

QUESTION 8.02 (2.00)

The plant is in Mode 3 when the following information is turned over to the on-coming Shift Supervisor:

1.8 gpm - leakage past check valves from RCS to SI Tanks (0.9 gpm each to SI Tanks A and B)
1.2 gpm - Primary to secondary leakage (total)
4.8 gpm - Total RCS leakage

Indicate whether any RCS leakage limits are exceeded, including the limit(s) that was(were) exceeded. (2.0)

ANSWER 8.02 (2.00)

The leakage limits for total SG leakage (0.5) of 1 gpm (0.5) and unidentified leakage (0.5) of 1 gpm (0.5) was exceeded.

REFERENCE
ANO2 Technical Specification 3.4.6.2
0020206011 3.3/4.0
0020206011 ...(KA'S)

QUESTION 8.03 (2.00)

The ANO2 Technical Specifications require that the four SI Tanks be operable in Modes 1, 2, and 3. What four (4) conditions are required to be verified to satisfy this requirement? VALUES ARE NOT REQUIRED, only the parameter need be listed. (2.0)

ANSWER 8.03 (2.00)

- Isolation valve open
- Water volume
- Boron concentration
- Cover pressure
(4 at 0.5 each)

REFERENCE
ANO Technical Specification 3.5.1
0060206005 3.5/4.2*
0060206005 ...(KA'S)

(***** CATEGORY 08 CONTINUED ON NEXT PAGE *****)

QUESTION 8.04 (1.00)

Per 10 CFR 55, "Operators' Licenses", what must be done by a licensed operator to maintain his/her license in an "active" status?" (1.0)

ANSWER 8.04 (1.00)

The operator shall actively perform the functions of the appropriately licensed operator (0.25) on a minimum of seven 8 hour shifts (0.25) or five 12 hour shifts (0.25) per calendar quarter (0.25).

REFERENCE
10 CFR 55.53(e)
19400;A103 2.5/3.4
19400;A103 ...(KA'S)

QUESTION 8.05 (2.50)

TRUE or FALSE: (2.5)

a. A 10 CFR 50.59, "Changes, Tests, and Experiments", review is required for changes to non-safety related procedures as well as safety related procedures.

b. A Senior Reactor Operator is a "certified 10 CFR 50.59 reviewer" due to having an active SRO license.

c. A procedure change that expands the acceptance criteria of a surveillance does not constitute a change of intent of the procedure.

d. The Interim Procedure Approval Process may be used to implement a procedure change that changes the intent of a procedure as long as it does not involve an unresolved safety question.

e. Following interim approval of a procedure change applicable to BOTH units, the change form will be placed in the procedure change update manual binder in the Unit 1 Control Room.

ANSWER 8.05 (2.50)

a. true
b. false
c. false
d. false
e. true
(0.5 each)

REFERENCE
ANO 1000.06, Procedure Review, Approval, and Revision Control, Rev 27, pg 3, 9, 15
194001A101 3.3/3.4
194001A101 ...(KA'S)

QUESTION 8.06 (2.00)

a. List, in order of preference, the three (3) means of communication to be used for IMMEDIATE NOTIFICATIONS to the NRC. (1.5)

b. WHO, by title, is normally designated to make this notification? (0.5)

ANSWER 8.06 (2.00)

a. 1. ENS
2. Commercial
3. HPN
(0.4 for each line, 0.1 for each preference)

b. Shift Administrative Assistant (0.5)

REFERENCE
ANO 1000.08, NRC Reporting and Communications, Rev 24, pg 10 - 12
194001A104 3.0/3.2
194001A104 ...(KA'S)

(***** CATEGORY 08 CONTINUED ON NEXT PAGE *****)

QUESTION 8.07 (3.00)

a. What two (2) persons, by title, may sign for authorizing the placement of Hold Cards? (0.5)

b. What two persons, by title, are required to review the tagout for adequate boundary isolation? (0.5)

c. What two (2) persons, by title, may authorize intentionally entering an Action Statement of Tech Specs due to tagging? (1.0)

d. List the order of placing and removing contractor tags and ANO Hold Cards when being used on the same component (which tags should be hung first, removed first, etc.). (1.0)

ANSWER 8.07 (3.00)

a. SS or CRS (0.25 each) on the affected unit

b. Licensed Operator and Lead Craftsman (0.25 each)

c. Affected Unit's Operations Superintendent or Operations Manager (0.5 each)

d. Install ANO Hold Card, then contractor tag. Remove contractor tag, then ANO Hold Card (1.0).

REFERENCE
ANO 1000.27, Hold and Caution Card Control, Rev 10, pg 12-14, 23
194001K102 3.7/4.1
194001K102 ...(KA'S)

QUESTION 8.08 (3.00)

a. List five (5) examples of temporary modifications. (2.0)

b. Arrange the following list of personnel in order of preference for performing the independent verification of a temporary modification installation. STATE WHICH ORDER THE LIST IS IN, i. e. most to least preferred. (1.0)

1. Cognizant engineer
2. Another lead craftsman of the same discipline
3. Responsible supervisor
4. Cognizant SRO on the affected unit

ANSWER 8.08 (3.00)

a. - Lifted leads for the purpose of altering a function
- Electrical jumpers
- Pulled circuit cards
- Intentionally disabled annunciator alarms
- Mechanical jumpers
- Blank flanges
- Disabled relief or safety valves
- Temporary power supplies
- Rotation of spectacle flange
(5 required at 0.4 each)

b. 3, 2, 1, 4 (0.33 for each manipulation to put in the correct order)
(most to least preferred)

REFERENCE
ANO 1000.28, Temporary Modification Control, Rev 8, pgs 4, 19
194001A103 2.5/3.4
194001A103 ...(KA'S)

QUESTION 8.09 (2.50)

a. When an event occurs that is common to both units such as a security alert, fire in a common building, etc., which Shift Supervisor is responsible for responding to the event? (0.5)

b. Key shift personnel shall not enter areas from which they cannot respond to the control room within 10 minutes. Name TWO (2) positions which fall under "key shift personnel." (1.0)

c. List two (2) areas from which returning to the control room may take more than 10 minutes. (1.0)

ANSWER 8.09 (2.50)

a. The SS receiving the notification (0.5) is responsible for incident response.

b. Shift Supervisor and STA (0.5 each)

c. - cooling tower area
- containment
- emergency cooling pond area
(2 at 0.5 each)

REFERENCE
ANO 1015.01, Conduct of Operation, Rev 32, pg 10, 25
194001A103 2.5/3.4
194001A103 ...(KA'S)

QUESTION 8.10 (1.00)

TRUE or FALSE:

a. Non-licensed operators may manipulate the reactor reactivity controls if directly supervised by a licensed operator and the trainee is enrolled in a license training program. (0.5)

b. Non-licensed operators may operate indirect controls of reactivity such as steam generator pressure or feed flow with the knowledge and consent of a licensed control room operator (direct supervision is not required). (0.5)

ANSWER 8.10 (1.00)

a. true (0.5)

b. true (0.5)

REFERENCE
ANO 1015.01, Conduct of Operation, Rev 32, pg 17, 18
194001A111 2.8/4.1*
194001A111 ...(KA'S)

(***** CATEGORY 08 CONTINUED ON NEXT PAGE *****)

QUESTION 8.11 (3.00)

a. Define a Category "E" valve? (1.0)

b. What physically ensures that their position remains as intended? (0.5)

c. Who may waive the independent verification on Category "E" valve operations (non-emergency)? (0.5)

d. TRUE or FALSE. When an independent verification is performed on a Category "E" valve, it is not necessary to actually reposition the valve. (0.5)

e. TRUE or FALSE. Independent verification of throttle valve position may be accomplished by observing the first operator throttling the valve. (0.5)

ANSWER 8.11 (3.00)

a. Valves in the flow path of a safety related system (0.33) required to be in a specified position for the system to perform its safety function (0.33) and whose mispositioning could go undetected from the control room (0.34).

b. All category "E" valves are locked (0.5).

c. Operations Superintendent (0.5)

d. True (0.5)

e. True (0.5)

REFERENCE
ANO 1015.01, Conduct of Operation, Rev 32, pgs 40-41
194001K101 3.6/3.7
194001K101 ...(KA'S)

SIMULATION FACILITY FIDELITY REPORT

Facility Licensee: Arkansas Power & Light Company

Facility Licensee Docket No.: 50-368

Facility License No.: NPF-6

Operating Tests Administered At: Arkansas Nuclear One, Unit 2

Operating Tests Given On: April 19-20, 1988

During the conduct of the simulator portion of the operating tests identified above, the following apparent performance and/or human factors discrepancies were observed:

1. CCW Pump A (2P33A) red, run light is off even when the pump is running. The green light stays on constantly. Candidates noticed this during their board walkdowns prior to starting the exams. This had been previously identified by the facility and a Discrepancy Report (DR 88-036) had been previously generated.

2. We received two inadvertent reactor trips during the exams. One was a low reactor pressure of approximately 1640 psig. No evolutions were in progress that should have caused a spike pressure drop, and return to approximately 2200 psig. The cause of the trip, low pressure, was determined later by simulator personnel. The cause of the pressure indication is unknown. The second trip was preceded by abnormal S/G pressure on the "A" S/G. Again, no evolutions were in progress that would have caused a S/G pressure transient. One of the candidates observed the RCS pressure indication on the CPCs drop from approximately 2200 psig to 14 psig, then return to 2200 psig. Cause of the pressure transients is unknown.

3. The annunciator horn occasionally sounds with no visual annunciator illuminated. Lamp test does not indicate any burned out lamps. This malfunction and the inadvertent trips are being investigated as they occur.

4. Bypassing Nuclear Instrumentation inputs to the protective system is very cumbersome and time consuming and cannot faithfully reproduce plant performance in a timely manner. Instead of having a bypass switch feature like in the plant, each light and CPC/PPS input or light must be individually manipulated by the simulator operator, or the indicating lights on the panels must be individually operated in override to get the desired result. Facility is presently working on obtaining and installing bypass switch panels.

5. When a Linear Power Channel fails low, a CPC Sensor Failure light on the CPCs was anticipated, as well as a CPC Trouble annunciator. Neither was received. Subsequent investigation by the facility revealed that the malfunction model does not insert the failure into the circuitry where the indications would function. The simulator responds faithfully for where the failure occurs, but was not what was anticipated. The facility personnel stated that a new malfunction would be created to model the desired failure properly (DR 88-057).

6. During an inadvertent SIAS actuation, the SIAS indicating lights on the CPC/PPS panels never went out. It was determined that where the malfunction inserts the failure into the circuitry is downstream of the indicating lights, which was not anticipated. The failure insertion point will be remodeled (DR 88-061).

7. With EDG "A" out of service, EDG B was given a fail-to-start malfunction, and SIAS "B" was inadvertently initiated. The A4 vital bus could not be reenergized, from anywhere, and it should have been able to be manually reenergized by the operators. Investigation by the simulator staff after the exam found that the transfer logic from SIAS interfered with the normal bus transfer logic and would not allow the operators to reenergize the bus. That is incorrect. The problem was identified in the model and will be corrected (DR 88-054).

8. During a pressurizer safety valve failing open malfunction, subcooling and RCS temperature indications on the SPDS fluctuated drastically. RCS temperature varied from 440°F to 15°F to 440°F instantaneously with similar changes in subcooling. The SPDS indication in the plant has a lower range of approximately 400°F and would not show these type changes. The drastic changes were explained as being due to the heat transfer model showing slugs of voids/superheat moving through the system in a linear fashion with the large changes occurring instantaneously as these slugs reach the various temperature detectors. DR 88-058 was generated to remodel the range of the simulator SPDS to match the range of the actual SPDS in the plant.

9. It appears that too many area radiation monitors alarm in containment on a leaking pressurizer safety valve. The monitor at the personnel hatch alarmed which seems unrealistic. The leak was 75 gpm into the quench tank, which was still intact. This is being investigated under DR 88-059.

ANSWER 6.10 (3.00)

a. CIAS (5)
SIAS (1)
CCAS (7)
MSIS (4)
(0.25 each)

b. SIAS (1)
CSAS (2)
CIAS (5)
CCAS (7)
MSIS (4)
RAS (3)
(0.166 each)

c. none (8)
(1.0)

REFERENCE
AA-52002-013 ESFAS
STM-2-70 PPS/ESF
013000K101 4.2/4.4
013000K101 ...(KA'S)

QUESTION 6.11 (2.00)

The operability of the main steam isolation valves ensures that no more than one steam generator will blow down in the event of a steam line rupture. What are two reasons for limiting the effect of a steam line rupture to the blow down of one steam generator? (2.0)

ANSWER 6.11 (2.00)

1. Minimize the positive reactivity effects of the RCS cooldown associated with the blowdown. (1.0)
2. And limit the pressure rise within the containment in the event that the rupture occurs inside the containment. (1.0)

REFERENCE
Technical Specifications 3.7.1.5 Bases
0390006006 2.2/3.1
0390006006 ...(KA'S)

(***** CATEGORY 06 CONTINUED ON NEXT PAGE *****)

QUESTION 6.12 (1.00)

Fouling of the surface of the throat of a Feedwater Venturi has occurred during extended operation. Will indicated feedwater flow be GREATER, LESS, or the SAME as actual flow? JUSTIFY YOUR ANSWER. (1.0)

ANSWER 6.12 (1.00)

The effective inside diameter (from increased friction and actual narrowing) of the throat will be decreased, this will raise the differential pressure being measured (0.5), and thereby give a GREATER than actual flowrate indication (0.5)

REFERENCE
ANO HT, Thermodynamics, Fluids, pg 126
191002K101 2.2*/2.4
191002K101 ...(KA'S)

QUESTION 6.13 (1.00)

Indicate whether each of the following is TRUE or FALSE concerning 480 volt Motor Control Center Operation. (1.0)

a. If the control power fuses are blown, the load may still be operated by depressing the contactors.

b. If the control power fuses are blown, the load may still be operated by using the local handswitch.

c. Depressing the open/close contactors does not bypass the valve position/torque contacts in the control circuit.

ANSWER 6.13 (1.00)

a. true (0.33)

b. false (0.33)

c. fa'se (0.33)

REFERENCE
AA-52002-007
0620006009 3.2/3.3
0620006009 ...(KA'S)

(***** END OF CATEGORY 06 *****)