October 4, 2001

Mr. Ralph Butler, Chief Operating Officer
Research Reactor Facility
University of Missouri
Columbia, MO 65211

SUBJECT: INITIAL EXAMINATION REPORT NO. 50-186/OL-01-03

Dear Mr. Butler:

During the week of September 10, 2001, the NRC administered initial examinations to employees of your facility who had applied for a license to operate your University of Missouri – Columbia Reactor. The examination was conducted in accordance with NUREG-1478, "Non-Power Reactor Operator Licensing Examiner Standards," Revision 1. At the conclusion of the examination, the examination questions and preliminary findings were discussed with those members of your staff identified in the enclosed report.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) http://www.nrc.gov/NRC/ADAMS/indesx.html. The NRC is forwarding the individual grades to you in a separate letter which will not be released publicly. Should you have any questions concerning this examination, please contact Paul Doyle at (301) 415-1058 or pvd@nrc.gov.

Sincerely,

/RA by Patrick M. Madden Acting for/

Eugene V. Imbro, Acting Chief
Operational Experience and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-186

Enclosures:
1. Initial Examination Report No. 50-186/OL-01-03
2. Facility comments with NRC resolution
3. Examination and answer key (RO/SRO)

cc w/encls:
Please see next page

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DISTRIBUTION w/ encls.:

PUBLIC	REXB r/f	EImbro	PMadden
CBassett	AAdams	PDoyle	

Facility File (EBarnhill) O-6 D-17

ADAMS ACCESSION #: ML012690591 **TEMPLATE #:NRR-074**

OFFICE	REXB:CE	E	IOLB	E	REXB:SC		REXB:ABC	
NAME	PDoyle		EBarnhill		PMadden		EImbro	
DATE	09/ 27 /2001		09/ 28 /2001		10/ 01 /2001		10/ 01 /2001	

C = COVER E = COVER & ENCLOSURE N = NO COPY

cc:

University of Missouri
Associate Director
Research Reactor Facility
Columbia, MO 65201

A-95 Coordinator
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Mr. Ron Kucera, Director
Intergovernmental Cooperation
and Special Projects
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

U. S. NUCLEAR REGULATORY COMMISSION
OPERATOR LICENSING INITIAL EXAMINATION REPORT

REPORT NO.: 50-186/OL-01-03

FACILITY DOCKET NO.: 50-186

FACILITY LICENSE NO.: R-103

FACILITY: University of Missouri Columbia

EXAMINATION DATES: September 10-11, 2001

EXAMINER: Paul Doyle, Chief Examiner

SUBMITTED BY: /RA/ 09/18/2001
Paul V. Doyle Jr., Chief Examiner Date

SUMMARY:

During the week of September 10, 2001, the NRC administered operator licensing examinations to two reactor operator candidates and three senior reactor operator (upgrade) candidates. All license candidates passed all portions of their individual examinations.

REPORT DETAILS

1. Examiner: Paul V. Doyle Jr., Chief Examiner

2. Results:

	RO PASS/FAIL	SRO PASS/FAIL	TOTAL PASS/FAIL
Written	2/0	0/0	2/0
Operating Tests	2/0	3/0	5/0
Overall	2/0	3/0	5/0

3. Exit Meeting: (Note: UMC = University of Missouri-Columbia)
Paul Doyle, NRC, Chief Examiner
Paul Hobbs, UMC, Reactor Manager
Ralph Butler, UMC, Chief Operating Officer, Research Reactor Facility

During the exit meeting Mr. Doyle thanked the University staff for their support in the administration of examination, and informed the facility that he did not note any generic weaknesses during the administration of the operating tests. The facility staff told Mr. Doyle that they would have comments on the written exam e-mailed within the week.

ENCLOSURE 1

E-Mail received from Les Foyto:

Mr. Doyle,

Comments on the written NRC exam administered at MURR on September 10th, 2001:

A.7 Should change question to operation at 10 MW for 24 hours.

B.5 Answers to b and c are reversed.

C.2 No answer in answer key, correct answer is b.

C.3 Both choices “a” and “d” are correct.

C.5 Update answer so that it only says “Wide Range Monitor”

C.8 Correct answer is: a, 4R; b, 6R; c, 6T; d, 4T; e, 6R; f, 4R (radial and tangential are reversed.

C.14 Correct answer for f can be either Geiger-Mueller or ion chamber but not BF_3 ion chamber, depending on which Bridge ARM. Correct answer for h, should be ion chamber but not BF_3 ion chamber.

If you have any questions please feel free to call or e-mail me.
Respectfully,

Les Foyto
Assistant Reactor Manager - Engineering

NRC Resolution

A.7 Agree, no change to grading.

B.5 Agree, answer key corrected.

C.2 Agree, (typo) answer key corrected.

C.3 Agree, answer key corrected.

C.5 Agree, no change to grading.

C.8 Agree, answer key corrected.

C.14 Parts “f” and “h”, deleted, each choice now worth ⅓ point.

Examiner Review of Examination

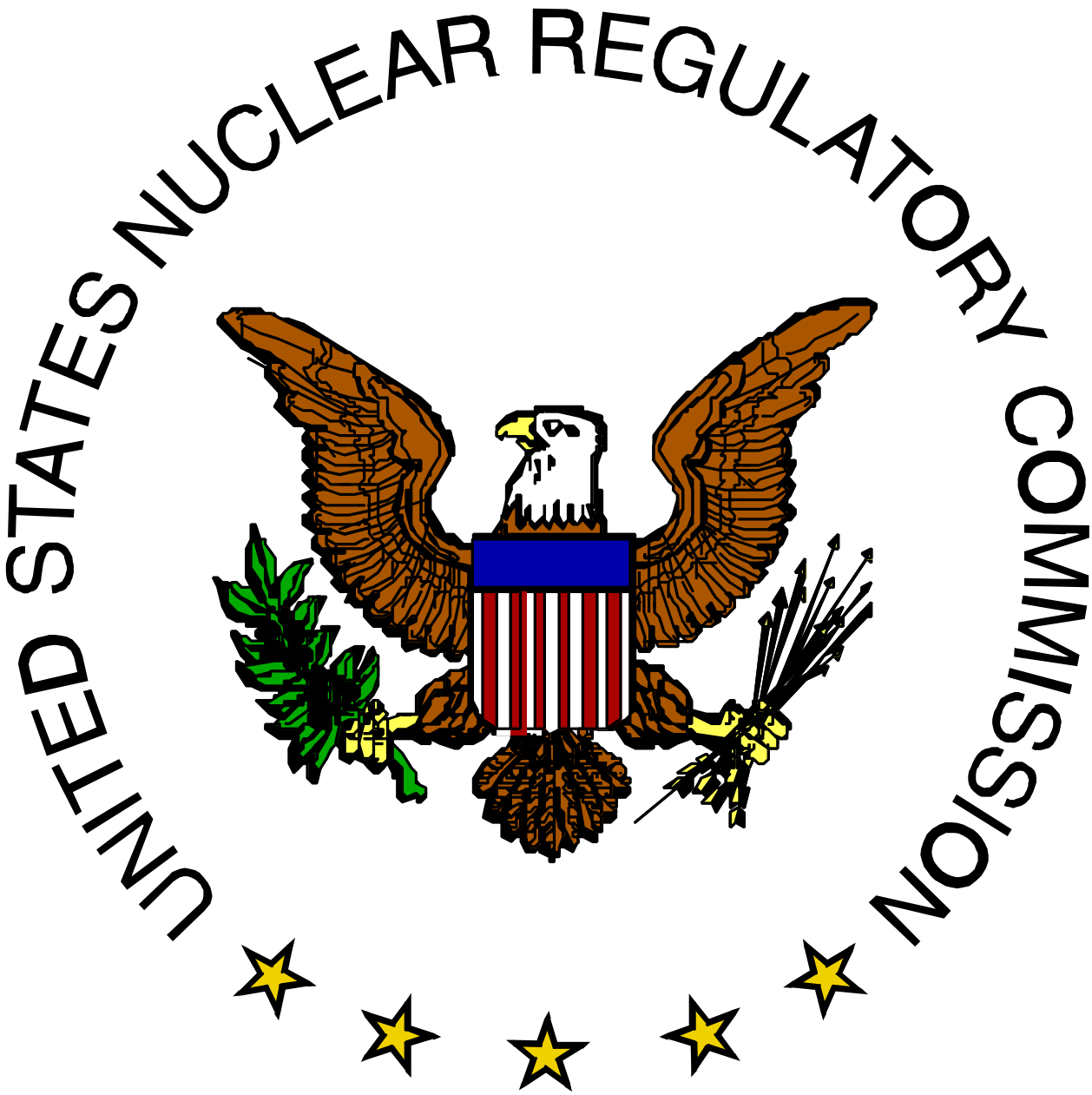
C.10 Question deleted. Although both the question and answer are both correct, this is very properly not stressed in training, as it did not work.

C.12 Question deleted. Improper question format.

ENCLOSURE 2

UNIVERSITY OF MISSOURI–COLUMBIA

With Answer Key



OPERATOR LICENSING
EXAMINATION
September 11, 2001

ENCLOSURE 3

QUESTION A.1 [1.0 point]
Inserting a control rod predominantly affects K_{eff} by changing the …

a. fast fission factor

b. thermal utilization factor

c. neutron reproduction factor

d. resonance escape probability.

QUESTION A.2 [1.0 point]
You enter the control room and note that all nuclear instrumentation show a steady neutron level, and no rods are in motion. Which ONE of the following conditions CANNOT be true?

a. The reactor is critical.

b. The reactor is sub-critical.

c. The reactor is super-critical.

d. The neutron source has been removed from the core.

QUESTION A.3 [2.0 points, ½ point each]
Match each term in column A with the correct definition in column B.

Column A	Column B
a. Prompt Neutron	1. A neutron in equilibrium with its surroundings.
b. Fast Neutron	2. A neutron born directly from fission.
c. Thermal Neutron	3. A neutron born due to decay of a fission product.
d. Delayed Neutron	4. A neutron at an energy level greater than its surroundings.

QUESTION A.4 [1.0 point]
The delayed neutron precursor (β) for U^{235} is 0.0065. However, when calculating reactor parameters you use β_{eff} with a value of ~0.0070. Why is $_{\beta eff}$ larger than β?

a. Delayed neutrons are born at higher energies than prompt neutrons resulting in a greater worth for the neutrons.

b. Delayed neutrons are born at lower energies than prompt neutrons resulting in less leakage during slowdown to thermal energies.

c. The fuel also contains U^{238} which has a relatively large β for fast fission.

d. U^{238} in the core becomes Pu^{239} (by neutron absorption), which has a higher β for fission.

QUESTION A.5 [1.0 point]
Five minutes following a reactor shutdown, the source range monitor is reading 3×10^6 counts/minute. Which ONE of the following is the count rate you would expect to see three minutes later

a. 10^6 counts/minute

b. 8×10^5 counts/minute

c. 5×10^5 counts/minute

d. 3×10^5 counts/minute

QUESTION A.6 [2.0 points, ½ each]
Match type of radiation (Column A) with the proper penetrating power (Column B).

a.	Gamma	1.	Stopped by thin sheet of paper
b.	Beta	2.	Stopped by thin sheet of metal
c.	Alpha	3.	Best shielded by light material
d.	Neutron	4.	Best shielded by dense material

QUESTION A.7 [1.0 point]
Which one of the following figures most closely depicts the reactivity versus time plot for xenon for the following series of evolutions: (See attached figures on last page of handout for choice selections.)

TIME	EVOLUTION
1-2	10 MW startup, clean core; Operation at ~~5~~ 10 MW for 24 hours;
3	Shutdown for 15 hours;
4	~~5~~ 10 Mw for 12 hours.

a. a

b. b

c. c

d. d

QUESTION A.8 [1.0 point]
The neutron microscopic cross-section for absorption σ_s generally…

a. increases as neutron energy increases.

b. decreases as neutron energy increases.

c. increases as the mass of the target nucleus increases.

d. decreases as the mass of the target nucleus increases.

QUESTION A.9 [1.0 point]
ELASTIC SCATTERING is the process by which a neutron collides with a nucleus and …

a. recoils with the same kinetic energy it had prior to the collision

b. recoils with less kinetic energy than it had prior to the collision with the nucleus emitting a gamma ray.

c. is absorbed, with the nucleus emitting a gamma ray.

d. recoils with a higher kinetic energy than it had prior to the collision with the nucleus emitting a gamma ray.

QUESTION A.10[1.0 point]
Which ONE of the following describes the response of the subcritical reactor to **EQUAL** insertions of positive reactivity as the reactor approaches criticality? Each reactivity addition will cause …

a. a **SMALLER** increase in neutron flux, resulting in a **LONGER** time to reach equilibrium.

b. a **LARGER** increase in neutron flux, resulting in a **LONGER** time to reach equilibrium.

c. a **SMALLER** increase in neutron flux, resulting in a **SHORTER** time to reach equilibrium.

d. a **LARGER** increase in neutron flux, resulting in a **SHORTER** time to reach equilibrium

QUESTION A.11[1.0 point]
The effective neutron multiplication factor, K_{eff} is defined as…

a. absorption/(production + leakage)

b. (production + leakage)/absorption

c. (absorption + leakage)/production

d. production/(absorption + leakage)

QUESTION A.12[1.0 point]
Which one of the following is the correct reason that delayed neutrons allow human control of the reactor?

a. More delayed neutrons are produced than prompt neutrons.

b. Delayed neutrons increase the mean neutron lifetime.

c. Delayed neutrons take longer to thermalize than prompt neutrons.

d. Delayed neutrons are born at higher energies than prompt neutrons.

QUESTION A.13[1.0 point]
Which ONE of the following reactor changes require a control rod INSERTION to return reactor power to its initial level following the change?

a. Formation of N^{16} in the coolant.

b. Removal of an experiment with positive reactivity from the reactor.

c. Buildup of Xe^{135}

d. A fault in the automatic system resulting in a primary coolant temperature decrease.

QUESTION A.14[1.0 point]
Which ONE of the following is the correct reason burnable poison is added to the core?

a. To minimize the effects of a rod withdrawal accident.

b. To increase the power achievable for a given core size.

c. To allow addition of additional fuel to compensate for burnup.

d. To decrease the effects of Xenon and Samarium on the core.

QUESTION A.15[1.0 point]
The number of neutrons passing through a one square centimeter of target material per second is the definition of which one of the following?

a. Neutron Population (np)

b. Neutron Impact Potential (nip)

c. Neutron Flux (nv)

d. Neutron Density (nd)

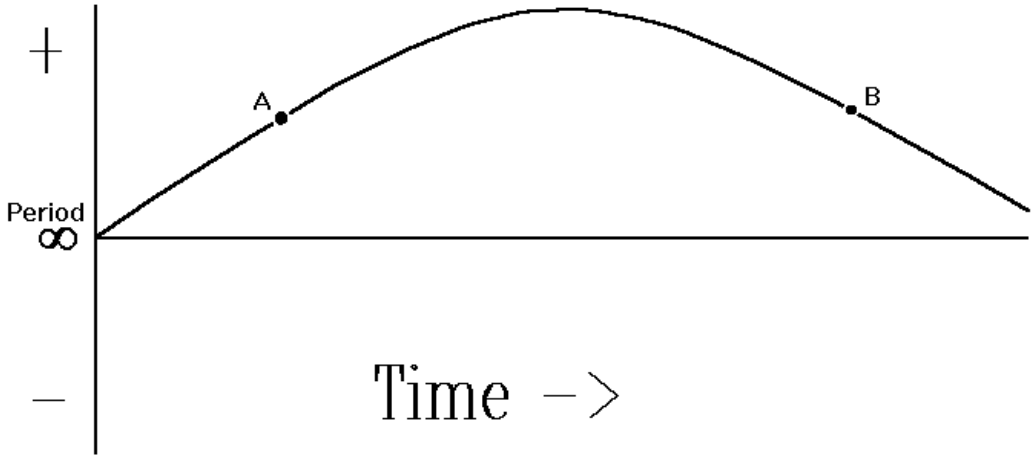
QUESTION A.16[1.0 point]
Shown below is a trace of reactor period as a function of time. Between points A and B reactor power is:

a. continually increasing.

b. continually decreasing.

c. increasing, then decreasing.

d. constant.



QUESTION A.17[1.0 point]
During a reactor startup, criticality occurred before the value calculated. Which ONE of the following reasons could be the cause?

a. Experiment adding positive reactivity.

b. Xe^{135} peaked.

c. Moderator temperature increased.

d. Power defect (Reactor power increasing).

QUESTION A.18[1.0 point]
Which ONE of the following factors is the most significant in determining the differential worth of a control rod?

a. The rod speed.

b. Reactor power.

c. The flux shape.

d. The amount of fuel in the core.

QUESTION B.1 [1.0 point]
You've detected a stuck rod. Which ONE of the following is your immediate action(s) according to REP-8?

a. Attempt to drive the affected rod in until power decreases by 2%.

b. Drive all shim rods in verifying the stuck rod fails to move.

c. Scram the reactor, noting the position of the stuck rod.

d. Stop all rod movement, and notify the Shift Supervisor.

QUESTION B.2 [1.0 point]
When pumping the Liquid Waste tanks to the sanitary sewer, the maximum accumulated activity for nuclides other than H^3 is 2 millicuries for the Lead Senior Reactor Operator to authorize the procedure. The maximum accumulated activity for H^3 is …

a. 5 millicuries

b. 10 millicuries

c. 15 millicuries

d. 20 millicuries

QUESTION B.3 [1.0 point]
ANNUAL maintenance was last performed on a system on July 31, 2001. The last date annual maintenance may be performed on the system without being late is …

a. July 31, 2002

b. August 31, 2002

c. September 30, 2002

d. October 31, 2002

QUESTION B.4 [2.0 points, ½ point each]
Match the type of radiation in column A with its associated Quality Factor (10CFR20) from column B.

Column A	Column B
a. alpha	1
b. beta	2
c. gamma	5
d. neutron (unknown energy)	10
	20

QUESTION B.5 [2.0 points, ½ point each]
Match each of the Technical Specification Limits in column A with its corresponding value in column B. (Each limit has only one answer, values in Column B may be used more once, more than once or not at all.)

	Column A	Column B
a.	Minimum Shutdown Margin	0.0980 ΔK
b.	Each secured Removable Experiment	0.0200 ΔK
c.	Core Excess Reactivity	0.0060 ΔK
d.	Absolute Value of all experiments in Center test hole	0.0025 ΔK
e.	Movable parts of any individual experiments	0.0010 ΔK
f.	Each Unsecured Experiment	

QUESTION B.6 [1.0 point]
Which ONE of the following locations is NOT an Emergency Command Center per the Emergency Plan?

a. Control Room

b. Research Park Development Building

c. Dalton Cardiovascular Research Center

d. Facility Front Lobby

QUESTION B.7 [1.0 point]
10CFR50.54(x) states: "A licensee may take reasonable action that departs from a license condition or a technical specification (contained in a license issued under this part) in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and technical specifications that can provide adequate or equivalent protection is immediately apparent." 10CFR50.54(y) state that the minimum level of management which may authorize this action is …

a. any Reactor Operator licensed at facility

b. any Senior Reactor Operator licensed at facility

c. Facility Manager (or equivalent name at facility).

d. NRC Manager

QUESTION B.8 [1.0 point]
The reactor has been shutdown for the last three hours due to electrical storms, (intermittent loss of power). No shutdown checksheet has been performed. Which of the following meets the MINIMUM requirements to restart the reactor?

a. You may perform a hot startup with the SRO directing.

b. You may startup after performing a short form Startup Checksheet.

c. You may startup after ensuring the Primary system is on-line per the applicable SOP, then performing a short form Startup Checksheet.

d. You may startup after performing a Full Power Startup Checksheet.

QUESTION B.9 [1.0 point]
Which ONE of the following conditions would NOT preclude sending a volunteer into a high radiation area in order to save a life?

a. The radiation levels in the area are unknown.

b. All volunteers are women of child bearing age.

c. All volunteers are men under the age of 45.

d. The only volunteer is a new hire, not trained in the consequences of receiving an emergency dose.

QUESTION B.10 [1.0 point]
Which ONE of the following radiation monitors may be placed out of service for two hours for maintenance or calibration, providing no experimental or maintenance activities are conducted which could likely result in the release of unknown quantities of airborne radioactivity.

a. Reactor Bridge Radiation Monitor

b. Reactor Building Exhaust air plenum Radiation Monitor

c. Stack Radiation Monitor

d. Reactor Bridge ALARA Radiation Monitor

QUESTION B.11 [1.0 point]
A radiation survey instrument was used to measure an irradiated experiment. The results were 100 mrem/hr with the window open and 60 mrem/hr with the window closed. What was the beta dose?

a. 100 mrem/hr

b. 60 mrem/hr

c. 40 mrem/hr

d. 140 mrem/hr

QUESTION B.12 [1.0 point]
According to MURR Technical Specifications which one of the following is the maximum primary coolant pressure allowed during normal operation?

a. 70 psig

b. 100 psig

c. 110 psig

d. 125 psig

QUESTION B.13 [1.0 point]
The Primary System Fuel Failure Monitor has failed. Which ONE of the following actions must you take, if any, to comply with Technical Specifications?

a. Immediately SCRAM the reactor.

b. Commence a normal reactor shutdown within 15 minutes.

c. Make arrangements to have the primary coolant sampled once every 4 hours.

d. No actions are required.

QUESTION B.14 [1.0 point]
Which ONE of the following is **NOT** a responsibility of the Console Operator following a reactor isolation?

a. Verify that the containment building has sealed by the ventilation door and exhaust valve indication lights.

b. Ensure all personnel have evacuated all levels of the containment building.

c. Position himself at the outer airlock allowing only authorized personnel entry.

d. Investigate the cause of the alarm and magnitude of the incident.

QUESTION B.15 [1.0 point]
Which ONE of the following Reactor Emergencies would require you to insert a manual rod run-in as an immediate action?

a. Failure of experimental apparatus

b. High radiation levels

c. Nuclear instrumentation failure

d. Control rod drive failure/stuck rod

QUESTION B.16 [1.0 point]
Which **ONE** of the following control rod manipulations is **NOT** by procedure?

a. Gang operation of the control rods after criticality to reduce power.

b. Gang operation of the control rods as part of automatic shimming.

c. Simultaneous withdrawal of one control blade and the regulating blade.

d. Gang operation of the controls rods during hot startup.

QUESTION B.17 [1.0 point]
Which **ONE** of the following statements correctly defines the term "Instrument Channel Test?"

a. The introduction of a signal into a channel and observation of the proper channel response.

b. An arrangement of sensors, components and modules as required to provide a single trip or other output signal relating to a reactor or system operating parameter.

c. The qualitative verification of acceptable performance by observation of channel behavior.

d. The adjustment of a channel such that its output corresponds with acceptable accuracy to known values of the parameter which the channel measures.

QUESTION B.18 [1.0 point]
If the reactor is not critical when the upper ECP limit is reached, you must:

a. stop and recalculate the ECP prior to further rod withdrawal.

b. shut down the reactor.

c. verify the ECP with a 1/M plot.

d. check the control rod position transmitters.

QUESTION C.1[1.0 point]
Which ONE of the following is the reason for the 100 gallon holdup tank in the purification system? This tank

a. is part of the regeneration system.

b. allows N^{16} gamma activity to decay off.

c. contains spent resin from the demineralizer units.

d. provides water hammer protection for the purification system.

QUESTION C.2[1.0 point]
Which ONE of the Radiation Monitors is used to track radioactive Argon, Neon and Krypton to the environment?

a. Bridge ALARA

b. Stack Gas

c. Stack Particulate

d. Stack Iodine

QUESTION C.3[1.0 point]
Which ONE of the following electrical loads CANNOT be supplied by the Emergency Generator?

a. Pool Cooling Pumps

b. Exhaust Fan EF-13

c. Intercom System

d. Pool Pump P508A

QUESTION C.4[1.0 point]
What is the purpose of the ventilation ducts built in to the pool wall? These ducts are designed to remove …

a. H^3

b. N^{16}

c. Ar^{41}

d. I^{131}

QUESTION C.5[1.0 point]
Which ONE of the following Nuclear Instrument Channels has an input into the regulating blade auto control circuit.

a. Channel 1 (Source Range Monitor)

b. Channel 2 (Intermediate Range (Log-N))

c. ~~Channel 4~~ (Wide Range Monitor)Changed per facility comment.

d. Channel 6 (Power Range Monitor)

QUESTION C.6[1.0 point]
The corrosion inhibitors require a pH range between 7 and 8 to work correctly. Which ONE of the following is added to the secondary to maintain the pH?

a. Carbonic Acid

b. Sulfuric Acid

c. Sodium Hydroxide

d. Potassium-Tetraborate-Tetrahydrate.

QUESTION C.7[1.0 point]
The purification system contains a fission product monitor. This monitor detects radiation from fission products collected in …

a. the filter

b. the holdup tank

c. the cation column

d. the anion column

QUESTION C.8[2.0 points, ⅓ each]
Match each of the beamports in column A with the correct characteristics in Column B

	Column A Beamport	Column B Characteristic
a.	A	6" radial (6R)
b.	B	6" tangential (6T)
c.	C	4" radial (4R)
d.	D	4" tangential (4T)
e.	E	
f.	F	

QUESTION C.9[1.0 point]
Which ONE of the following conditions is required for proper operation of the Anti-siphon system?

a. System pressure must be less than 10 psig.

b. System pressure must be greater than 27 psig.

c. System water level must be less than 10 inches above the antisiphon valves.

d. System water level must be more than 6 inches above the antisiphon valves.

QUESTION C.10 [1.0 point]
What design feature of the new fission chambers was supposed to reduce rod shadowing effects?

a. Short active length, with adjustable height.

b. Tubes are located in the gaps between the control blades.

c. Long active length.

d. Fission chambers measure fast neutron leakage, unaffected by control rods which are thermal neutron poisons.

QUESTION C.11 [1.0 point]
The normal (green) lamp on an Area Radiation Monitor is out. This is an indication of …

a. too low a voltage to the detector.

b. the Sr^{90} test source is missing

c. too many pulses to the detector (saturation).

d. the signal due to the Sr^{90} test source is verified correct.

QUESTION C.12 [1.0 point]
Which ONE of the following alarms on the control panel is NOT associated with the startup interlock?

a. Channel 1 Low Count rate

b. Nuclear Instrument Anomaly

c. Thermal Column Door Open

d. Jumper Board in Use

QUESTION C.13 [1.0 point]
Which ONE of the following is the reason that the pool DI system water returns to the pool about 2 feet below the pool surface? In order to …

a. aid in the mixing of the water, which results in a more even temperature distribution.

b. create a blanket of warmer water at the top of the pool to reduce mixing, and therefore reduce the dose rate at the surface of the pool.

c. reduce pool surface temperature, since DI water is cooler than pool water.

d. reduce interference between the pool cooling system and the pool skimmer, which takes its suction at the pool surface.

QUESTION C.14 [2.0 points, ½ each]
Match the channel in column A with the correct detector in column B.

Column A	Column B
a. Fission Product Monitor	1. Geiger Müeller
b. Secondary Coolant Monitor	2. Scintillation Detector
c. Stack Gas Monitor	3. GeLi Detector
d. Stack Particulate Monitor	4. BF_3 Ion Chamber Detector
e. Stack Iodine Monitor	
f. Bridge ARMS	
g. Exhaust Plenum 1	
h. Room 114 ARMS	

QUESTION C.15 [1.0 point]
How long and why must you wait to start a second secondary cooling pump.

a. 5 minutes, to allow for makeup to the sump basin.

b. 5 minutes, to prevent electrical overload trip

c. 10 minutes, to allow for makeup to the sump basin.

d. 10 minutes, to prevent electrical overload trip

QUESTION C.16 [2.0 point, 0.4 each]
Indicate whether each of the following reactivity coefficients are positive or negative for the indicated locations.

a. Void Coefficient of the Flux Trap

b. Void Coefficient of the Core

c. Temperature Coefficient of the Core

d. Temperature Coefficient of the Pool

e. Temperature Coefficient of the Flux Trap

QUESTION C.17 [1.0 point]
A facility evacuation may be initiated from …

a. the control room and the front lobby.

b. the control room and the electronics shop.

c. the reactor bridge and the front lobby.

d. the reactor bridge and the electronics shop.

A.1 b
REF:

A.2 c
REF:

A.3 a, 2; b, 4; c, 1; d, 3
REF:

A.4 b
REF:

A.5 d
REF:

A.6 a. 4; b. 2; c. 1; d. 3
REF: Basic Nuclear Concepts, p. 7.4.2

A.7 a
REF:

A.8 b
REF:

A.9 a
REF:

A.10 b
REF:

A.11 d
REF:

A.12 b
REF:

A.13 d
REF:

A.14 c
REF:

A.15 c
REF:

A.16 a
REF: Non-Power Generic Fundamentals Bank

A.17 a
REF:

A.18 c
REF:

B.1 c
REF: Reactor Emergency Procedure 8

B.2 b
REF: Reactor Operator Training Manual, § I.10.2, p. 2, 1st ¶.

B.3 c
REF: T.S. 1.2 Calibration or Testing Interval.

B.4 a, 20; b, 1; c, 1; d, 10
REF: 10CFR20.100x

B.5 a, 0.02; b, 0.006; c, 0.098; d, 0.006; e, 0.001; f, 0.0025 Corrected per facility comment.
REF: Technical Specifications § 3.1 Reactivity Specifications e, f, g, h, i, and j.

B.6 c
REF: SEP-1, §II.2 and 6.

B.7 b
REF: 10CFR50.54(y)

B.8 d
REF: SOP I.4.3.F.1 Startup Checksheet §§ a & b

B.9 c
REF: SEP 11 Monitoring Planned Exposures in excess of Limits in 10 CFR 20. SEP Worksheet D. Previously asked question from EQB.

B.10 c
REF: Technical Specifications, Table in § 3.4(a).

B.11 c
REF: Instrument reads only γ dose with window closed. Instrument reads both β and γ dose with window open. Therefore, β dose is window open dose less window closed dose.

B.12 c.
REF: Technical Specification 3.4

B.13 c
REF: Technical Specifications, § 3.9 Coolant System, pg. 1 of 3.

B.14 d
REF: FEP-2

B.15 a
REF: REP-10; REP-4; REP-5; REP-8

B.16 c
REF: SOP-I.4.3.D Control Blade Operation, p. SOP/I-5

B.17 a
REF: MURR TS, § 1.8

B.18 b
REF SOP I.4.3.G.5 p. SOP/I-7

C.1 b
REF: Reactor Operator Training Manual, § I.4 Clean-up Systems, p. I.4.1 3rd ¶

C.2 b Answer key updated per facility comment.
REF: Reactor Operator Training Manual § II.

C.3 d or a, second correct answer added per facility comment.
REF: Training Manual for Reactor Operators, § III.1 Electrical Power Distribution and § III.3 Emergency Electrical System

C.4 a
REF: Reactor Operator Training Manual, § I.11, Containment Building Exhaust System p. I.11.1, 2nd ¶.

C.5 c
REF: Reactor Operator Training Manual, § II.14, p. II

C.6 b
REF: Reactor Operator Training Manual, § IV.5, Secondary Chemistry Control, p. IV.5.1 2nd ¶.

C.7 d
REF: Rewrite of facility supplied question, Plant and Radiation monitoring Systems, #28.

C.8 a, 4R; b, 6R; c, 6T; d, 4T; e, 6R; f, 4R
REF: Rewrite of facility supplied question, Plant and Radiation Monitoring Systems, #32.

C.9 b
REF: SOP/IV.3.1, also NRC administered examination from 1997

~~C.10 e~~ Question deleted per examiner review.
~~REF: x~~

C.11 a
REF: RO Training Manual § II.

~~C.12 d~~ Question Deleted per examiner review.
~~REF: Drawing # 79, HSR § 9.5 Startup Interlocks, Training Manual for ROs § II.14.A Rod Control System/Shim-Safety Rod Control, p. II.14.2~~

C.13 b
REF: MURR HSR, § 7.1.10 p. 7-20.

C.14 a, 2; b, 2; c, 1; d, 2; e, 2; ~~f, 1~~; g, 1; ~~h, 1~~ parts f and h deleted per facility comment.
REF: MURR Facility prepared Requalification Examination administered 11/93.

C.15 c
REF: NRC examination bank, SOP § VI.1.H

C.16 a. positive b. negative c. negative d. positive e. positive
REF: MURR Hazards Summary Report, p. 4-14.,SOP/VIII-7 Critical Parameters List

C.17 a
REF: Training Manual for Reactor Operators § II.10, p. II.10.1. Also 02/92 NRC examination.

ACCESSION NUMBER:

SUBJECT: INITIAL EXAMINATION REPORT NO. 50-186/OL-01-03

	NAME	DATE
1.	PDOYLE	09/ /2001
2.	EBARNHILL	09/ /2001
3.	PMADDEN	09/ /2001
4.	EIMBRO	09/ /2001
5.	SECRETARY (dispatch)	09/ /2001

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