ENCLOSURE 1

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

REPORT NO.: 50-288/OL-92-01

FACILITY DOCKET NO.: 50-288

FACILITY LICENSE NO.: R-112

FACILITY: Reed Reactor Facility

EXAMINATION DATE: March 25, 1992

EXAMINER: Paul Doyle, Chief Examiner

SUBMITTED BY: Paul W. Doyle 4/13/92
Paul Doyle, Chief Examiner Date

APPROVED BY: James L. Caldwell 4/13/92
James L. Caldwell, Chief Date
Non-Power Reactor Section
Operator Licensing Branch
Division of Licensee Performance
and Quality Evaluation, NRR

SUMMARY:

The applicant passed an RO Retake examination consisting of Section B, (NORMAL AND EMERGENCY PROCEDURES AND RADIOLOGICAL CONTROLS), of the written examination. This section had previously been failed in the initial examination administered August 26, 1991.

Sections A and C of the written examination and the operating examination were waived in accordance with examiner standard ES-204-D.

During the performance of the August 1991 examinations the NRC noted a weakness in the candidate's comprehension of Reed's administrative procedures and practices. Based on the performance of the RO candidate during the retake examination, the facility has shown an improvement in training personnel in this area.

REPORT DETAILS

1. Examiner:

   Paul V. Doyle, Jr., Chief Examiner

2. Results:

	RO (Pass/Fail)	SRO (Pass/Fail)	Total (Pass/Fail)
NRC Grading:	1/0	0/0	1/0

3. Written Examination:

   The RO retake examination consisted of only Section B, (NORMAL AND EMERGENCY PROCEDURES AND RADIOLOGICAL CONTROLS), of the written examination. Sections A and C of the written examination were waived in accordance with examiner standard ES-204-D.

4. Operating Examinations:

   The RO operating examination was waived in accordance with examiner standard ES-204-D.

5. Exit Meeting:

   Personnel attending: Michael Pollock, Director, Reed Reactor Facility
   Paul V. Doyle, Jr., Chief Examiner

   No program weaknesses were noted during the examination.

Question 011
Per Reed's Emergency Implementation Procedures what is the lowest level of authority (Emergency Coordinator) who can authorize personnel to reenter the facility following an evacuation alarm?

a. Senior Reactor Operator on Site

b. Facility Director

c. Facility Supervisor

d. Reactor Operations Committee

Answer 011:
a

Facility Comment 004:
The correct answer to this question is a) as given in the detailed answer and reference sheet. The copy of the brief Answer Key which I was provided gives this answer as b). I was informally notified by Mr. Doyle that my copy of the Answer Key had been corrected and that a) would be accepted as the correct answer.

NRC Resolution 011:
The correct answer is a.

ENCLOSURE 2

FACILITY COMMENTS AND NRC RESOLUTION OF COMMENTS

SECTION B

Question 004
Calculate the Shutdown Margin with the Reg rod stuck all the way out. Assume the following worths:

Control rods-	Shim: . . .	$3.73
	Reg: . . .	$1.33
	Safety . .	$3.73
Excess Reactivity:		$3.00

a. $0.73
b. $2.06
c. $3.00
d. $5.80

Answer 004:
a

Facility Comment 004:
The wording in this question is potentially confusing. In our training program we use the term shutdown margin to refer to the difference between the "worth" of operable control rods and the core excess. The question implies that only the Regulating Rod is stuck and thus the shutdown margin is really $4.46, and answer which is not one of the options. The examiner is correct in referencing the Technical Specifications, Section F3, which provides a limit on the "minimum shutdown margin" ... *with the most reactive of the operable control elements withdrawn*". We have interpreted this limit to be a qualification on "minimum shutdown margin" as a condition of operation and not as part of the definition of "shutdown margin" itself (italics added). However since the only answer which makes any sense is a), it is the answer the candidate should have given and we do not beleive it should be eliminated from this exam.

NRC Resolution:
Comment noted. No change made for grading.

ENCLOSURE 3

U. S. NUCLEAR REGULATORY COMMISSION
NON-POWER REACTOR LICENSE EXAMINATION

FACILITY: Reed Inst.

REACTOR TYPE: TRIGA

DATE ADMINISTERED: 92/03/27

REGION: 5

CANDIDATE: Josh Filner

LICENSE APPLIED FOR: Reactor Operator

INSTRUCTIONS TO CANDIDATE:
Answers are to be written on the exam page itself, or the answer sheet provided. Write answers one side ONLY. Attach any answer sheets to the examination. Points for each question are indicated in parentheses for each question. A 70% in each section is required to pass the examination. Examinations will be picked up one (1) hour after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE	CATEGORY
19.00	100.00	_____	_____	B. NORMAL AND EMERGENCY OPERATING PROCEDURES AND RADIOLOGICAL CONTROLS
19.00		_____ FINAL GRADE	_____%	TOTALS

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

_____
Candidate's Signature

B. NORMAL/EMERG PROCEDURES & RAD CON

ANSWER SHEET

Multiple Choice (Circle or X your choice)
If you change your answer, write your selection in the blank.

001 a b c d ___

002 a b c d ___

003 a b c d ___

004 a b c d ___

005 a b c d ___

006 a b c d ___

007 a b c d ___

008 a b c d ___

009 a b c d ___

010 a b c d ___

011 a b c d ___

012 a b c d ___

013 a b c d ___

014 a b c d ___

015 a b c d ___

016 a b c d ___

017 MATCHING

a ___

b ___

c ___

018 a b c d ___

019 a b c d ___

(***** END OF CATEGORY B *****)
(********** END OF EXAMINATION **********)

ENCLOSURE 3

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 candidate 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.

6. Write your answers on the answer sheet provided.

7. Print your name in the upper right-hand corner of the first page of your answer sheet.

8. The point value for each question is indicated in parentheses after the question. The amount of blank space on an examination question page is NOT an indication of the depth of answer required.

9. Partial credit will NOT be given on multiple choice questions.

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

11. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.

12. To pass the examination, you must achieve at least 70% in each category.

14. There is a time limit of (1) hour for completion of the examination.

QUESTION: 001 (1.00)

As defined by Technical Specifications, which ONE of the following statements is NOT part of the definition for a "Shutdown" Reactor.

a. The console key is in the "OFF" position and the key is removed from the console and under the control of a licensed operator.

b. No work is in progress involving fuel handling or maintenance of control rod drive mechanisms.

c. The minimum shutdown margin, with the most reactive of the operable control elements withdrawn shall be $1.10

d. Sufficient control rods are inserted so as to assure the reactor is subcritical by a margin greater than 0.7 Δk/k, cold without Xenon.

QUESTION: 002 (1.00)

In accordance with 10 CFR 20 (Standards for Protection Against Radiation), which ONE of the following is the radiation dose standard for individuals in restricted areas per calendar quarter? (Assume that NRC Form 4 is NOT on file.)

a. Whole body - 1.25 Rem
Active blood forming organs 1.25 Rem
Hands and forearms - 7.5 Rem
Skin of whole body - 18.75 Rem

b. Whole body - 3.75 Rem
Active blood forming organs 1.25 Rem
Hands and forearms - 7.5 Rem
Skin of whole body - 18.75 Rem

c. Whole body - 1.25 Rem
Active blood forming organs 1.25 Rem
Hands and forearms - 18.75 Rem
Skin of whole body - 7.5 Rem

d. Whole body - 3.75 Rem
Active blood forming organs 3.75 Rem
Hands and forearms - 18.75 Rem
Skin of whole body - 7.5 Rem

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

QUESTION: 003 (1.00)

10 CFR 20.105 sets "permissible" levels of radiation in unrestricted areas. What is the 10 CFR 20 whole body MAXIMUM dose limit, in any period of one calendar year in an "unrestricted" area?

a. 1.25 Rem

b. 500 mrem

c. 200 mrem

d. 100 mrem

QUESTION: 004 (1.00)

Calculate the Shutdown Margin with the Reg rod stuck all the way out. Assume the following worths:

Control rods- Shim: $3.73
Reg:. $1.33
Safety: $3.73

Excess reactivity: $3.00

a. $0.73

b. $2.06

c. $3.00

d. $5.80

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

QUESTION: 005 (1.00)

Which ONE of the following is the correct posting if the radiation level in the area is 75 mr/hr?

a. CAUTION RADIATION AREA

b. CAUTION RADIOACTIVE MATERIAL(S)

c. CAUTION AIRBORNE RADIOACTIVITY AREA

d. CAUTION HIGH RADIATION AREA

QUESTION: 006 (1.00)

Which ONE of the following is the amount of time a licensed operator must perform his/her licensed duties to maintain proficiency?

a. Four hours per month

b. Four hours per quarter

c. Six hours per month

d. Six hours per quarter

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

QUESTION: 007 (1.00)

Which ONE of the following statements describe a reactivity limitation imposed on experiments?

a. The absolute reactivity worth of all experiments in the reactor shall not exceed $2.00

b. An experiment which will not cause a 20-sec period can be inserted in the core when the reactor is at power.

c. When determining the absolute reactivity worth of an experiment, the reactivity effects associated with the moderator temperature is to be considered.

d. No experiment shall be inserted or removed unless all control blades are fully inserted.

QUESTION: 008 (1.00)

An irradiated sample provides a dose rate of 200 mr/hr at 3 ft. Approximately how far from the sample must a CAUTION RADIATION AREA sign be posted?

a. 5 ft.

b. 8 ft.

c. 20 ft.

d. 50 ft.

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

QUESTION: 009 (1.00)

Which ONE of the following is the definition an UNUSUAL EVENT classification in accordance with the Nuclear Reactor Facility Emergency Plan?

a. Events are in progress or have occurred which have resulted or could result in radiation levels in excess of 100 mrem/hr at the operations boundary.

b. Events are in progress or have occurred which indicate a potential degradation of the safety of the reactor facility with no release of radioactive material requiring off site response.

c. Events are in progress or have occurred which have resulted or could result in exposures at the facility boundary in excess of 10CFR20 limits.

d. Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the facility.

QUESTION: 010 (1.00)

What is the minimum exposure monitoring requirement for escorted visitors to the reactor bay?

a. 1 TLD badge for every 10 members of the group

b. 1 neutron-gamma sensitive pocket dosimeter for the tour guide

c. 2 TLD badges for every 10 members of the group

d. 1 pocket dosimeter for each member of the group

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

QUESTION: 011 (1.00)

Per Reed's Emergency Implementation Procedures what is the lowest level of authority (Emergency Coordinator) who can authorize personnel to reenter the facility following an evacuation alarm?

a. Senior Reactor Operator on Site

b. Facility Director

c. Facility Supervisor

d. Reactor Operations Committee

QUESTION: 012 (1.00)

During a critical experiment, a 1/M plot is required to be taken. What does the 1/M plot represent?

a. The inverse of the moderator coefficient of reactivity

b. The inverse of core total U^{235} mass.

c. The inverse migration length of neutrons of varying energies

d. The inverse multiplication of the count rate between generations

QUESTION: 013 (1.00)

In the event of a life threatening injury of a heavily contaminated individual, the primary concern is:

a. decontamination

b. stabilization of the injury

c. psychological counseling

d. estimating the internal dose

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

QUESTION: 014 (1.00)

Your pocket dosimeter suddenly goes off-scale (high). What immediate action do you take?

a. Reset the dosimeter back to zero.

b. Leave the radiation area and notify Health Physics or Reactor Operations.

c. No immediate action necessary. Wait for routine processing of TLD to see if the exposure was real.

d. Stay where you are until help arrives.

QUESTION: 015 (1.00)

Two senior reactor operators (SROs) and one unlicensed trainee are the only people on-site during operations. One SRO becomes ill and leaves the site. The following action(s) must be taken with regard to reactor operation:

a. The reactor must be shutdown

b. Operations may continue unrestricted.

c. Operations may continue but only if the remaining SRO remains in the control room.

d. Operations may continue but only if the remaining SRO remains within the Reactor Laboratory area.

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

QUESTION: 016 (1.00)

Title 10 to the code of Federal Regulations (10 CFR 20) contains two different Quarterly exposure limit values. Which of the following statements is NOT related to the higher limit?

a. Cumulative lifetime dose will not exceed 5(N-18) [N = age]

b. Cumulate dose for the quarter will not exceed 3 Rem

c. An up-to-date NRC form 4 or equivalent is on file

d. Cumulative dose for the quarter will not exceed 1.25 Rem

QUESTION: 017 (1.00)

Match the radiation detectors in column a with it's typical use from column b. [0.33 each]

a. CD V - 715 model 1B (Ion Chamber)	1. Emergency β-,γ survey (High Range)
b. Eberline E-140 (Geiger Counter)	2. Frisk for personnel contamination
c. Eberline Model RO-2 (Ion Chamber)	3. Routine β-γ surveys (Daily)
	4. Neutron surveys

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

QUESTION: 018 (1.00)

You are the RO on duty during an experiment. You discover that the Core Excess reactivity Worth is 2.30% ΔK/K. In accordance with SOP-03, what actions should you take?

a. Scram the reactor, notify the Reactor Supervisor

b. Shutdown the reactor, notify the Senior Reactor Operator

c. Shutdown the reactor, record the time of the shutdown using a Purpose Stamp

d. No action is required. Technical Specifications have not been violated.

QUESTION: 019 (1.00)

Which of the following do NOT require NRC approval for changes?

a. Facility License

b. Facility Requalification Plan

c. Facility Emergency Implementation Procedures

d. Facility Emergency Plan

(***** END OF CATEGORY B *****)
(********** END OF EXAMINATION **********)

ANSWER: 001 (1.00)
c

REFERENCE:
T.S. Sect. A Definitions (1) Reactor Shutdown

ANSWER: 002 (1.00)
c

REFERENCE:
10 Cfr 20 sect. 20.101

ANSWER: 003 (1.00)
b

REFERENCE:
10 CFR 20.105

ANSWER: 004 (1.00)
a

REFERENCE:
RRF SAFETY ANALYSIS REPORT § 7 SAFETY ANALYSIS, p. 7 - 1, and RRF Training Manual 12-6-5 (Def of Excess Reactivity) and Technical Specifications § F.3 p. 3.

ANSWER: 005 (1.00)
a

REFERENCE:
10 CFR 20.202

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

ANSWER: 006 (1.00)
b

REFERENCE:
10 CFR 55 § 53(e)

ANSWER: 007 (1.00)
a

REFERENCE:
T.S. § 3.4(b)

ANSWER: 008 (1.00)
c

REFERENCE:
10CFR20 § 202

ANSWER: 009 (1.00)
b

REFERENCE:
RRF Safety Related Document "Emergency Plan" § 4.0 through 4.4

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

ANSWER: 010 (1.00)
d

REFERENCE:
Standard Operating Procedure 17 §17.4

ANSWER: 011 (1.00)
a

REFERENCE:
Emergency Procedures §3.1.2

ANSWER: 012 (1.00)
d

REFERENCE:
RRF Training Manual, p. 12-4-22

ANSWER: 013 (1.00)
B

REFERENCE:

ANSWER: 014 (1.00)
B

REFERENCE:

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

ANSWER: 015 (1.00)
C

REFERENCE:
RRF Administrative procedures, § III. 3.1(3)

ANSWER: 016 (1.00)

ANSWER: 017 (1.00)

a. 1
b. 2
c. 3

REFERENCE:
Reed Reactor Facility Portable Survey Instrument Instruction Manuals.

ANSWER: 018 (1.00)

a

REFERENCE:
SOP-03

ANSWER: 019 (1.00)
c

REFERENCE:
RRF 1990 RO Requal Exam

(***** END OF CATEGORY B *****)
(********** END OF EXAMINATION **********)

B. NORMAL/EMERG PROCEDURES & RAD CON

ANSWER KEY

001	c	013	B
002	c	014	B
003	b	015	C
004	a	016	d
005	a	017	MATCHING
006	t		a 1
007	a		b 2
008	c		c 3
009	b	018	a
010	d	019	c
011	a		
012	d		

(***** END OF CATEGORY B *****)
(********** END OF EXAMINATION **********)

ENCLOSURE 3

TEST CROSS REFERENCE

R O E x a m ? ? ? R e a c t o r

O r g a n i z e d b y Q u e s t i o n N u m b e r

QUESTION	VALUE	REFERENCE
001	1.00	9000550
002	1.00	9000551
003	1.00	9000552
004	1.00	9000553
005	1.00	9000554
006	1.00	9000555
007	1.00	9000556
008	1.00	9000557
009	1.00	9000558
010	1.00	9000559
011	1.00	9000560
012	1.00	9000561
013	1.00	9000562
014	1.00	9000563
015	1.00	9000564
016	1.00	9000565
017	1.00	9000566
018	1.00	9000567
019	1.00	9000568
	19.00	
	19.00	