February 28, 2005

Dr. Sheldon Landsberger
Nuclear Engineering Teaching Laboratory
10100 Burnet Road
University of Texas at Austin
Austin, TX 78758

SUBJECT:INITIAL EXAMINATION REPORT NO. 50-602/OL-05-01, UNIVERSITY OF TEXAS

Dear Dr. Landsberger:

During the week of January 24, 2005, the NRC administered operator licensing examinations at your Nuclear Engineering Teaching Laboratory. The examination was conducted in accordance with NUREG-1478, "Non-Power Reactor Operator Licensing Examiner Standards," Revision 1.

In accordance with 10 CFR 2.390 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 Phillip T. Young at 301-415-4094 or via Internet e-mail at pty@nrc.gov.

Sincerely,

/RA/

Patrick M. Madden, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-602

Enclosures: 1. Initial Examination Report No. NO. 50-602/OL-05-01
2. Facility comments with NRC resolution
3. Examination and answer key (RO/SRO)

cc w/encls.: Please see next page

cc:

Governor's Budget and
Planning Office
P.O. Box 13561
Austin, TX 78711

Bureau of Radiation Control
State of Texas
1100 West 49th Street
Austin, TX 78756

Mr. Roger Mulder
Office of the Governor
P.O. Box 12428
Austin, TX 78711

Dr. Sheldon Landsberger, Director
Nuclear Engineering Teaching
Laboratory
The University of Texas at Austin
10100 Burnet Road
Austin, TX 78758

Dr. William Vernetson
Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

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DISTRIBUTION w/ encls.:
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ADAMS Package Accession No.: ML043200631
ADAMS Report Accession No.: ML050450465 **TEMPLATE #: NRR-074**

OFFICE	RNRP:E/UI	E	IROB:LA		RNRP:SC	
NAME	PYoung		EBarnhill		PMadden	
DATE	02/ 14 /2005		02/ 16 /2005		02/ 16 /2005	

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

REPORT NO.: 50-602/OL-05-01

FACILITY DOCKET NO.: 50-602

FACILITY LICENSE NO.: R-129

FACILITY: University of Texas

EXAMINATION DATES: 01/26/2005

EXAMINER: Phillip T. Young, Chief Examiner

SUBMITTED BY: **/RA/** 02/ 14 /2005
Phillip T. Young, Chief Examiner Date

SUMMARY:

During the week of January 24, 2005, NRC administered Operator Licensing examinations to one Senior Reactor Operator (SRO). The one SRO candidate passed the examinations.

ENCLOSURE 1

REPORT DETAILS

1. Examiners:

   Phillip T. Young, Chief Examiner

2. Results:

	RO PASS/FAIL	SRO PASS/FAIL	TOTAL PASS/FAIL
Written	**0/0**	**1/0**	**1/0**
Operating Tests	**0/0**	**1/0**	**1/0**
Overall	**0/0**	**1/0**	**1/0**

3. Exit Meeting:

   Personnel attending:

   Sean O'Kelly, Associate Director
   Michael G. Krause, Reactor Supervisor
   Phillip Young, NRC

   The examiner thanked the facility for their support in conducting the examinations.

Facility Comments Regarding NRC Exam Administered on January 26, 2005

NONE

U. S. NUCLEAR REGULATORY COMMISSION
NON-POWER INITIAL REACTOR LICENSE EXAMINATION (Examination with Answer Key}

FACILITY: University of Texas

REACTOR TYPE: TRIGA

DATE ADMINISTERED: 01/26/2005

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:
Answers are to be written on the answer sheet provided. Attach the answer sheets to the examination. Points for each question are indicated in brackets for each question. A 70% in each section is required to pass the examination. Examinations will be picked up three (3) hours after the examination starts.

Category Value	% of Total	% of Candidates Score	Category Value	Category
20.00	33.3	_____	____	A. Reactor Theory, Thermodynamics and Facility Operating Characteristics
20.00	33.3	_____	____	B. Normal and Emergency Operating Procedures and Radiological Controls
20.00	33.3	_____	____	C. Facility and Radiation Monitoring Systems
60.00		_____	____%	TOTALS

FINAL GRADE

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

_____
Candidate's Signature

Reference: Answer: Which factor of the Six Factor formula is and Yes Questions [illegible]

d. c. b. a. d. c. b. a.

Fast Non-Leakage Fuel Utilization Factor (f) The [illegible] moved from the

A.002 A.002 A.001 A.001

3-18. Burn, R., [1.0 point] Standard NRC QUESTION [1.0 point]

{2.0} {

© 1982, § 3.2, pp. 3-13 —

[1.0 point]

	Rod Height	Count Rate
a.	Higher	Same
b.	Lower	Same
c.	Same	Lower
d.	Same	Higher

{4.0}

Answer: A.003 d.

Reference: Burn, R., *Introduction to Nuclear Reactor Operations*, © 1982, § 5.7, pp. 5-28 — 5-38.

Question A.004 [1.0 point]

Which one of the following atoms will cause a n… collision?

a. Uranium 238

b. Carbon 12

c. Hydrogen

d. Hydrogen

Answer: A.004 d.

Reference: Burn, R., *Introduction to Nuclear Reactor Operations*, © 1988, § 2.5.3 p. 2-45.

Question A.005 [1.0 point] {5.0}

For materials the neutron [illegible]

[illegible] rods.

[illegible]

Answer: A.005 b.

Reference: Burn, R., *Introduction to Nuclear Reactor Operations*, © 1982, § 2.5.1 p. 2-36.

Question A.006 [1.0 point] {6.0}

As [illegible] temperature increases, [illegible]

[illegible]

decrease[illegible]

Answer: A.006 c.

Reference: Burn, R., *Introduction to Nuclear Reactor Operations*, © 1982, § 3.3.2, p. 3-18

Question A.007 [1.0 point] {7.0}

Which one of the following factors has the [illegible]

a. [illegible]

b. [illegible] remi[illegible]

c. [illegible]

d. Xenon [illegible] temperature.

Answer: A.007 a.

Reference: Burn, R., *Introduction to Nuclear Reactor Operations*, © 1982, § 3.3.2, p. 3-18.

Reference: Answer: [illegible]

d. c. b. a. d. c. b. a.

critical [illegible]

A.009 A.009 A.008 A.008

UT-TRIGA Trn Man, Vol. IV, Nuclear Physics & Biotherm, Module 4, pg. 6. [1.0 point]

{9.0} {8

© 1982, § 3.2.4, p. 3-12.

A. REACTOR THEORY, THERMODYNAMICS & FACILITY OPERATING CHARACTERISTICS

A. REACTOR THEORY, THERMODYNAMICS & FACILITY OPERATING CHARACTERISTICS

Reference: Answer: [illegible]

d. c. b. a. d. c. b. a.

The [illegible]

A.011 A.011 A.010 A.010

UT-TRIGA Trn Man, Vol. IV, Nuclear Physics & RT Theory, Vol. V, Nuclear Physics & RT Theory, M

{11.0} {

Reference: Answer

d. c. b. a.

subcritical critical.

A.013

the reactor is supercritical. Reference: Answer

d. c. b. a.

Kinetic energy of the fission neutron

A.013

A.012

A.012

3.5% Mo-U235, reactivity of the Mo-U235 = -4.71% Δ

K/K; -4.71% +

{13.0}

Which of the following is an example of a

d. c. b. a.

d. c. b. a.

A.015 A.014

Module 2, pg. 2

{15.0}

{

Question:

Reference:

Answer:

d. c. b. a.

d. c. b. a.

d. c. b. a.

A.016

A.017

A.018

A.019

{17.0}

{18.0}

{19.0}

Reference: The major contributor to

Answer:

d. c. b. a.

from the [illegible]

A.019

Module 3, pg. 35-TRIGA Training Manual, Vol. IV, Nu

A. REACTOR THEORY, THERMODYNAMICS & FACILITY OPERATING CHARACTERISTICS

Question A.020 [1.0 point]

Shown below is a trace of reac... power...

a. constantly increasing.

b.

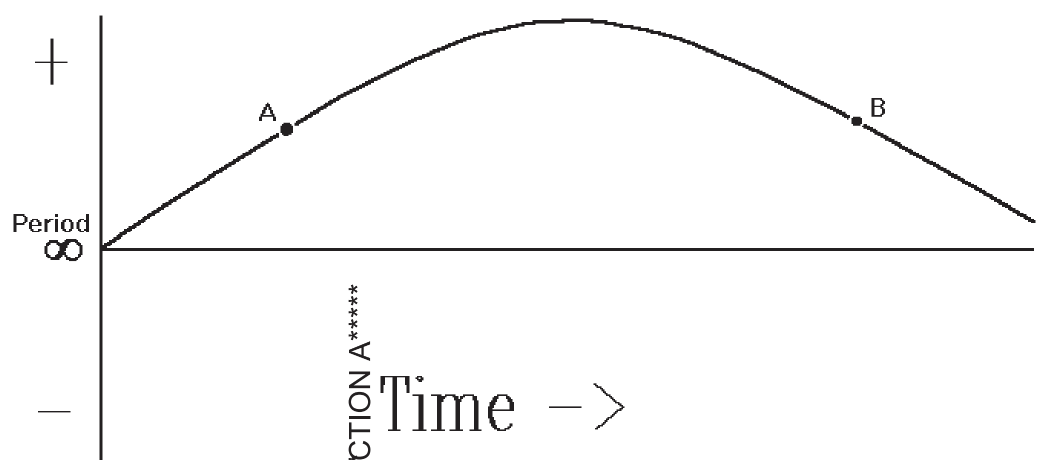
c.

d.

Answer: A.020

Reference: UT-TRIGA Training Manual, Vol. IV, Nuclear Phy... Module 4, pg. 11-...

Since the period is always positive, power m... increasing.



*****END OF SECTION A*****

*****END OF SECTION A*****

B. NORMAL/EMI

Reference: Answer: licensed to Reference (RO)? Which Section of the Facility Inc

Answer: Which ONE of the following persons is allowed to operate the facility uso

d. c. b. a. d. c. b. a.

maintain NRC's Selection, assigned to the facility, and the Facility Specification Subsequent Specifications set points are bei

B.002 B.002 B.001 B.001

b. [1.0 point] Chart of the Nuclides [1.0 point]

{2.0} {1.

B. NORMAL/EMI

Reference: Answer: In accordance with 10 CFR 20, the "Annual Limits on Intake (ALI)" [illegible]

d. c. b. a. d. c. b. a.

limits [illegible]

B.004 B.004 B.0003 B.003

Vol. II, a. Radiological Safety [1.0 points] Standard NRC Question . . [1.0 points, 1

{4.0} b. = hr;

c. = yr;

&

d. = hr;

B. NORMAL/EMI

Reference:

d. c. b. a.

integ

B.006

SAR, Section 4-1.

d. c. b. a.

dose

B.006

B.005

{6.0}

B.005

{5.

B. NORMAL/EMI

Reference: Answer: by: Prior to the movement of fuel out of the reactor, in Question of any conditions

d. c. b. a. d. c. b. a.

de-energizing the power to the drive motor for Fuel Bridge is Attended for Tool Gate to the Ship

B.008 B.008 B.007 B.007

FUEL-1, Movement of Fuel. [1.0 point] HP-1, Radiation Monitoring - Personnel [1.0 point]

{8.0} {7.

Question: B.009 [1.0 point] {9.

"Radiation Area" is a ...

a. 10 feet
b. 20 feet
c. 40 feet
d. 400 feet

Answer: c.
Reference: B.009 {10.0}

$DR_1 X_1^2 = DR_2 X_2^2$

$X_2^2 = 2000 \times 4 / 5$ ... $X_2 = 2$...

Question: B.010 [1.0 point]

Your Reactor Operator license expires after ____ years.

a. 2
b. 4
c. 6
d. 8

Answer: c.
Reference: B.010 10CFR55.55(a)

Reference:

Answer:

d. c. b. a.

auxili

B.012

Technical Specifications 3.3.2 & 3.3.3

[1.0 point]

viola

ating and with experiments in

d. c. b. a.

B.012

B.011

SOR-2 “Reactor Pool Calibration”

[1.0 point]

B.011

{12.0}

{1

B. NORMAL/EMI

Reference: Answer: Which ONE of the following is the Emergency Plan definition of Action Lo

Question: Question: Which ONE of the following is the Emergency Plan definition of Action Lo

d. c. b. a. d. c. b. a.

as specified by [illegible]

B.014 B.014 B.013 B.013

Emergency Plan, § 1.1 Definitions [1.0 point] 10 CFR 50.54 (q); 10 CFR 50.59; 10 CFR 50.5

{14.0} {13

Reference:

Answer:

d. c. b. a.

operation

B.016

d. c. b. a.

B.015

B.016

B.015

Tech Spec SS 2.1, 2.2.3, 3.1.1 and 3.2.4 (table 2.2-1)

{2.0 points, 0.5 each}

b. = LCO;

c. = SL;

{18.0}

d. = LCO

QUESTION B.017 [1.0 point]

... due to a radiological emergency, who ...

a.

b.

c.

d.

Answer: B.017

Reference: Standard Health Physics Definition.

{19 ...

QUESTION B.018 [1.0 point]

Following ... re-entry ...

a.

b.

c.

d. Emergency Director ...

Answer: B.018 d.

Reference: Emergency Plan, § 2.1.1, 4th ¶.

{20.0}

*****END OF SECTION B*****

SECTION C FAC

Reference: Answer: Classify the five Reference: Question: Each Beam Port has a Question of the differential

e. d. c. b. a. d. c. b. a.

Beam Port 1 Beam Port 2 maintain

C.002 C.002 C.001 C.001 in, to prote

Operation Support Systems §§ 3.4.1 – 3.4.3.

a. = Thru; [2.0 points, 0.4 each] [1.0 point]

SAR § 5.2.1, 3rd ¶.

Radial Thru Tangential

b. = Tangential; {1

{3.0}

c. = Radial;

d, = Radial;

e. = Thru

Reference:

Answer:

d. c. b. a.

Ar4

C.004

Technical Specification 3.3.3.

[1.0 point]

d. c. b. a.

C.004

C.003

Standard NRC Question

{5.0}

C.003

[1.0 point]

{4

Refe Answer:

d. c. b. a.

C.006

SAR 5.2.1 [1.0 point]

d. c. b. a.

C.006 C.005

Description, § 3.7.1, p. 20.

c. [1.0 point]

C.005

{7.0}

Answer: [illegible]

Which one of the following devices is tested d[illegible] [illegible] START interlock? [illegible]

Question [illegible] Reference: [illegible]

d. c. b. a.

Pool [illegible] switch [illegible]

C.009 C.009

b.

SCRAM Features [1.0 point] UTTRIGA Training Manual, Vol. V, ICS System [illegible]

d. c. b. a.

Only [illegible] Two [illegible]

C.008 C.008

{10.0}

d. c. b. a.

[illegible]

C.007 C.007

[1.0 point] UTTRIGA Training Manual, Vol. II, Control Console [illegible]

{9.0}

{8

SECTION C FAC

Reference:

Manual pg. 2-5 PER-1 Star

Reference: Answer: Which one of the following types of detection is used in the AUTOMATIC Process Control Systems

d. c. b. a. d. c. b. a. d. c. b. a.

Geiger-Mueller Detector. C.012 C.012 C.011 C.011 C.010 C.010

page 36. UT-TRIGA Training Manual, Vol. II, Rx Instrumentation & Control Systems, page 34. [1.0 point]

{13.0} {12.0}

Reference:

Answer:

Question

d. c. b. a.

C.015

SAR Section

[1.00]

{16.0}

Fuel

d. c. b. a.

C.014

SURV-1

5-3, 5-4.

[1.00]

{15.0}

d. c. b. a.

C.013

UT-TRIGA Training Manual, Vol. II, Control Console

[1.00]

{14.0}

Reference: Question Reference: The question referenced in the UT-TRIGA Operation Reference, the rod color is MAGENTA and the following

d. c. b. a. d. c. b. a. d. c. b. a.

calif[illegible]lium. both [illegible] fa

C.018 C.018 C.017 C.017 C.016 C.016

a. Vol. II, Rx Instrumentation & Control Systems, page 26. SAR 1.1.2

[1.00] [1.00] [1.00]

{19.0} {18.0} {17.0}

Vol. II, Description of TRIGA Mark II Reactor, page 16.

SECTION C FAC

Reference: Answer: fuel Which ONE of the following ter

d. c. b. a.

Center Outer Surface of the fuel element cladding.

C.019 C.019

c.

[1.00]

{20.0}

*****END OF EXAMINATION*****

*****END OF SECTION C*****