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		_____	____% FINAL GRADE	TOTALS

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

_____
Candidate's Signature

Reference: Question: Reference: Question: Reference:

Which Six Factor formula is a

Answer: Answer: Answer:

d. c. b. a.

Fast Fission Factor (f)

A.002

d. c. b. a.

The

A.001

moved from the

A.002

A.001

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

{2.0}

{

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

Answer: d. c. b. a.

Hydrogen
Carbon
Uranium 238
Lead

A.004

Question: Which of the following elements will cause a first collision of the greatest amount of neutrons to be lost?

d. c. b. a.

Lead
Uranium 238
Carbon
Hydrogen

A.003

[1.0 point]

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

A.003

Rod Height	Count Rate
Higher	Same
Same	Lower
Lower	Higher
Lower	Same

{4.0}

Question: For most materials the neutron

a. [illegible]
b. [illegible]
c. [illegible]
d. [illegible]

Answer: [illegible]

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

A.005 [1.0 point] {6.0}

Question: As the temperature increases, the [illegible] of the control rods.

a. [illegible]
b. [illegible]
c. [illegible]
d. [illegible]

Answer: [illegible]

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

A.006 [1.0 point] {7.0}

Question: Which of the following factors has the LEAST effect on the temperature coefficient of reactivity?

a. [illegible]
b. [illegible]
c. [illegible]
d. Xenon [illegible]

Answer: [illegible]

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

A.007 [1.0 point]

Reference:

Answer:

d. c. b. a.

critical

A.009

UT-TRIGA Trn Man, Vol. IV, Nuclear Physics & Theory, Module 4, pg. 6.

[1.0 point]

d. c. b. a.

A.009

A.008

{9.0}

Introduction to Nuclear Reactor Operations, © 1982, § 3.2.4, p. 3-12.

A. REACTOR THEORY, THERMODYNAMICS & FACILITY OPERATING CHARACTERISTICS

A.008

[1.0 point]

Reference: [illegible]

Answer: [illegible]

d. [illegible]

c. [illegible]

b. [illegible]

a. [illegible]

The [illegible]

A.011

UT-TRIGA Trn Man, Vol. IV, Nuclear Physics & RX Theory, [illegible]

d. [illegible]

c. [illegible]

b. [illegible]

a. [illegible]

A.010

{11.0}

A.010

[illegible] Nuclear Physics & RX Theory, [illegible]

{[illegible]

Reference Answer

d. c. b. a.

A.013

d. c. b. a.

A.013

d. c. b. a.

A.012

A.012

{13.0}

Question: Which ONE of the following is the

a. [illegible]
b. [illegible]
c. [illegible]
d. [illegible]

Answer: a

Reference: [illegible]

A.014

Question: Which ONE of the following is the

a. [illegible]
b. [illegible]
c. [illegible]
d. [illegible]

Answer: [illegible]

Reference: [illegible] below is an example of a [illegible]

A.015

Question: [illegible]

a. [illegible]
b. [illegible]
c. [illegible]
d. [illegible]

Answer: [illegible]

Reference: [illegible]

A.015

Module 2, pg. [illegible] {15.0}

Question Reference Answer:

A.016 d. c. b. a.

A.016 d. c. b. a.

A.017 d. c. b. a.

A.017 d. c. b. a.

A.018 d. c. b. a.

A.018 d. c. b. a.

A.019

[1.0] TRIGA Training Manual, Volume 1, Rev. 0 [1.0] TRIGA Training Manual, Volume 1, Rev. 0 [1.0] TRIGA Training Manual, Volume 1, Rev. 0 [

Reference: Module 3, pg. 35-TRUGA Training Manual, Vol. IV, Nu

Answer: The major contributor to

d. c. b. a.

from the [illegible]

A.019

A. REACTOR THEORY, THERMODYNAMICS & FACILITY OPERATING CHARACTERISTICS

Reference:

Answer: A.020

d. c. b. a.

A.020

Since the period is always positive, power must be increasing.

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

B. NORMAL/EM

Reference: Answer: licensed RO)? persons is a Which one of the following

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

main Air 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: In accordance with 10 CFR 20, the "Annual Limits on Intakes (ALI) and Derived Air Concentrations (DAC) for Occupational Exposure"

d. c. b. a.

limits in the [illegible]

B.004

Vol. II, a Radiological Safety

Question Reference: B.004

d. c. b. a.

[illegible]

B.0003

Standard Question

USNRC 1.07

Question . .

B.003

[1.0 points, 1

{4.0}

b. = hr;

c. = yr;

&

d. = hr;

B. NORMAL/EMI

Reference: Answer: temperature. Which ONE statement below describes the

d. c. b. a.

integ

B.006

SAR, Section 4-1.

B.006

dose rate is 60 mrem/hr.

d. c. b. a.

B.005

{6.0}

B.005

{5.

Reference: Answer: by Prior Question Reference Answer fuel out of the reactor, Question visitors, which

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

de- B.008 B.008 B.007 B.007

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

{8.0} {7.

Reference:
Answer:
d. c. b. a.
8 6 4 2
B.010
10CFR55.55(a)

You are the Reactor Operator
Question:
Reference:
Answer:
d. c. b. a.
10 feet 20 feet 40 feet 100 feet
B.009
c.
[1.0 point]
{10.0}

expires after ____ years
Question:
Reference:
Answer:
d. c. b. a.
B.009
[1.0 point]
{9.

Reference: Answer: [illegible] violation of Technical Specifications [illegible] operating and with experiments in [illegible]

d. c. b. a.

auxiliary [illegible]

B.012

Technical Specifications 3.3.2 & 3.3.3 [1.0 point]

B.012

d. c. b. a.

[illegible]

B.011

SUR V-2 “Reactor Pool Calibration”

B.011

[1.0 point]

{12.0}

{1

Reference: Emergency Plan, § 1.1 Definitions

Question: Which ONE of the following is the Emergency Plan definition of Actions

a.
b.
c.
d.

as specified

B.014

Question: Which ONE of the following is the Emergency Plan definition of Actions

a.
b.
c.
d.

B.013

[1.0 point] 10 CFR 50.54 (q); 10 CFR 50.59; 10 CFR 55.5

{14.0}

{13

Reference:

Answer:

d. c. b. a.

operability

B.016

Tech Spec SS 2.1, 2.2.3, 3.1.1 and 3.2.4 (table 2.1-3

b. = LCO;

c. = SL;

d. = LCO

d. c. b. a.

B.015

B.016

{2.0 points, 0.5 - Technical Specification Check}

{18.0}

B.015

c. = Cal; d. = C

[2.0 points, 0.5

B. NORMAL/EM

Reference: Question: Question: Question

SECTION C FAC

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

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

Beam Port 2 Beam Port 1 maintain in, to prote

C.002 C.002 C.001 C.001

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

SECTION C FAC

Reference: Technical Specification 3.3.3.

Answer: [illegible]

d. [illegible]

c. [illegible]

b. [illegible]

a. [illegible]

Ar4 [illegible]

C.004

[1.0 point]

Standard NRC Question

{5.0}

d. [illegible]

c. [illegible]

b. [illegible]

a. [illegible]

C.003

[1.0 point]

{4

SECTION C FAC

Reference: Answer: pool

d. c. b. a.

pool

C.006

SAR 5.2.1

C.006

[1.0 point]

d. c. b. a.

C.005

Description, § 3.7.1, p. 20.

c.

{7.0}

C.005

[1.0 point]

{6

Answer:

Which of the following devices is tested during the ONCE SYSTEM START checks?

d. c. b. a.

Pool Magnetic Switch

C.009

SCRAM Pump Test

{10.0}

Only two AUTOMATIC SYSTEM START checks are required to initiate the Reactor Protection System

d. c. b. a.

C.008

TRIGA Training Manual, Vol. II, Control Console

{9.0}

Which of the following

d. c. b. a.

C.007

TRIGA Training Manual, Vol. II, Control Console

{8

SECTION C FAC

Reference:

Manual pg. 2-6 OPER-1 Star

Reference: page 36. UT-TRIGA Training Manual, Vol. II, Chapter 5-8 [1.0 point]

Answer: d.

Question 11 Which one of the following types of detectors is used in the UT-TRIGA Training Reactor?

a. Geiger-Müller Tube Detector.
b. Ion Chamber.
c. Boron Tube Detector.
d. Fission Chamber.

C.012 C.012

Question 12 Which one of the following types of reactor protection systems is AUTOMATIC in operation?

a. Manual Scram.
b. Operator Initiated Scram.
c. Automatic Scram.
d. Operator Initiated Scram and Automatic Scram.

C.010 C.010

Question 13 Which one of the following types of reactor protection systems, [1.0 point]

a. Manual Scram.
b. Operator Initiated Scram.
c. Automatic Scram.
d. Operator Initiated Scram and Automatic Scram.

C.011 C.011

UT-TRIGA Training Manual, Vol. II, Chapter 5-8 [1.0 point]

{12.0}

UT-TRIGA Training Manual, Vol. II, Chapter 5-8 [1.0 point]

{13.0}

{1

Reference:

Answer:

Question

Fuel Which

d. c. b. a.

zirc

C.015

SAR Se

[1.00]

d. c. b. a.

B and

C.014

SURV-1

[1.00]

{16.0}

d. c. b. a.

State

C.013

UT-TRI

[1.00]

{15.0}

of the following sta

C.013

GA Training Manual, Vol. II, Control Console

[1.00]

{14.0}

Reference:

Answer:

Question Reference:

The [illegible] in the UT-TRIGA [illegible] Reference: [illegible] the rod color is [illegible]

d. [illegible]

c. [illegible]

b. [illegible]

a. [illegible]

C.018

d. [illegible] beryllium.

c. [illegible]

b. both [illegible]

a. [illegible]

C.018

d. [illegible]

c. [illegible]

b. [illegible]

a. [illegible]

C.017

d. [illegible]

c. [illegible]

b. [illegible]

a. [illegible]

C.017

d. [illegible]

c. [illegible]

b. [illegible]

a. [illegible]

C.016

d. [illegible] disadvantage fa

c. [illegible]

b. [illegible]

a. [illegible]

C.016

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

SAR 4.2.

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

Answer: fuel element cladding.

d. Centerline temperature of the fuel

c. Heat conduction from the fuel

b. Gap heat transfer

a. Gap gas pressure

Question: Which one of the following ter

C.019 C.019

c.

[1.00]

{20.0}

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

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