License: 17-27076-01
Docket: 030-32230

Materials **T**esting **S**ystems, Inc
PO Box 97245
Lakewood, WA 98497
253-686-9000
mtsinc@comcast.net

July 18, 2014

Ms. Jacqueline "Jackie" D. Cook
Senior Health Physicist
US Nuclear Regulatory Commission Region IV
Division of Nuclear Materials Safety
Nuclear Materials Safety Branch B
1600 East Lamar Blvd., Arlington, TX 76011

Ms. Cook,

I am attaching several documents aimed at demonstrating my compliance with all NRC requirements, including those specified in NUREG-1556 Vol 1.

My certification documents date back to 1995. Since that time I have instructed hundreds of classes—both Gauge Operator courses and Radiation Safety Officer courses. Many of these were performed while I was an employee of Troxler Electronic Laboratories, and many more, over the past 6 years, as Materials Testing Systems. I have also attached both Gauge Operator and RSO manuals.

I hope this satisfies both your requirements and your curiosity. Should you require anything further, please do not hesitate to contact me. I would also extend an invitation to you or any other representative of the NRC to any of my classes.

Respectfully,

Stephen "Steve" R. Tucker
President

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☐ A.3 Sensitive-Security Related
☐ A.7 Sensitive Internal
☐ Other: _____

Reviewer: _____ Date: 7/24/14

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License: 11-27076-01
Docket: 030-32930

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RADIATION SAFETY EXAMINATION

Part 1 - Multiple Choice

Do not write on this test. Please write all answers on the yellow card given out with this test.

1. The half life of Cesium-137 is?
   A. 4.5 years
   B. 432 years
   C. 30 years
   D. 12 years

2. The regulatory maximum allowable whole-body radiation dose for a gauge operator is set at:
   A. 5,000 mRem per year
   B. 100 mRem per year
   C. 1250 mrem per year
   D. 50 mrem per year

3. Which of the following materials are effective forms of shielding for gamma radiation?
   A. concrete
   B. lead
   C. steel
   D. A, B, and C

4. Of the following, which is the most penetrating to human flesh?
   A. alpha particles
   B. beta particles
   C. gamma rays
   D. ultraviolet rays

5. The Transport Index (TI) is the highest measured level of radiation at what distance?
   A. 15 feet
   B. 1 meter
   C. Package Surface
   D. 2 meters

6. Radiation exposure is harmful to biological material because of:
   A. Ionization
   B. Skin sensitivity
   C. Environmental Conditions
   D. Oxidation

7. The "RQ" on the package label stands for:
   A. Radiation Quantity
   B. Regulated Quantity
   C. Radiation Quota
   D. Reportable Quantity

8. The type of license issued for possession and use of a Troxler Model 3440 is:
   A. General License
   B. Specific License
   C. Industrial Radiography License
   D. Limited License

9. If the exposure rate @ 2 feet is 400 mR/hr and @ 4 feet is 100 mR/hr, what is the exposure rate at 8 feet?
   A. 600 mR/hr
   B. 150 mR/hr
   C. 25 mR/hr
   D. 10 mR/hr

10. In the event a gauge is lost or stolen, the _____ should be notified immediately.
    A. Radiation Safety Officer
    B. The job superintendent
    C. The Company controller
    D. Chief of police

11. The average American is exposed to the following amount of radiation annually from natural background and medical uses.
    A. 30 millirem
    B. 300 millirem
    C. 3000 millirem
    D. 30,000 millirem

12. If a station wagon or van is used to transport a nuclear gauge, the gauge shall be placed:
    A. Immediately behind the driver
    B. Behind the rearmost passenger seat
    C. On the floor of the front seat
    D. At any location within the vehicle

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Reviewer: JDC Date: 7/24/14

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13. The radiation label on the Troxler Model 3440 transport case is called?
    A. White I
    B. Yellow II
    C. Yellow III
    D. White III

14. The type of radiation used to measure the density of a material is?
    A. Microwave
    B. Neutrons
    C. Beta Particles
    D. Gamma Photons

15. The storage area for a gauge should be at least _____ from a full-time work station:
    A. 5 feet
    B. 15 yards
    C. 15 feet
    D. 100 yards

Part 2 - True or False

16. Radiation safety training is recommended, but not required for individuals working with portable gauges.

17. Time, distance and shielding are appropriate methods of minimizing exposure to radiation.

18. An unnecessary exposure to radiation is an excessive exposure.

19. A radioactive source in a moisture/density gauge emits radiation only when the gauge is turned on.

20. The gauge may be transported on the floorboard of the front passenger seat of a vehicle if no one is sitting in that seat.

21. Neutron radiation is used to measure the moisture content of soil aggregates.

22. Alpha and Beta particles are produced by the sources in the moisture density gauges, but the encapsulation prevents this radiation from escaping.

23. A survey meter is used to detect the presence of radiation.

24. Hazmat training must be conducted annually.

25. A declared pregnant woman is allowed to receive only 500 mrem for the entire term of pregnancy.

26. Regulations require that individuals under 18 years of age may receive 5,000 mrem per calendar year (whole body).

27. When transporting the gauge, a Bill of Lading must be carried in the vehicle where it can be seen by a person entering the vehicle.

28. Your TLD badge should be stored in the gauge transport case during periods when the gauge is not being used.

29. Your Company's license allows use of the gauge in all fifty states and Canada.

30. Never share your TLD badge with a fellow worker.

Certificate of Completion

This Certifies that

STEPHEN R. TUCKER

has successfully completed the

Troxler Radiation Safety Officer Course

conducted by the training program of

Troxler Electronic Laboratories, Inc.

Stewart Spraggins	08/23/95	WILLIAM F. TROXLER
STEWART SPRAGGINS		
Instructor	Date	President

TROXLER ELECTRONIC LABORATORIES, INC.

HEREBY CERTIFIES THAT

STEPHEN R. TUCKER

of

TROXLER ELECTRONIC LABS., INC.

HAS SUCCESSFULLY COMPLETED THE TROXLER ELECTRONIC LABORATORIES, INC. TRAINING COURSE FOR THE USE OF NUCLEAR TESTING EQUIPMENT.

SUBJECTS INCLUDED IN THIS COURSE WERE AS FOLLOWS:

Radiological Safety

1. *Principles and practices of radiation protection.*
2. *Leak testing procedures.*
3. *Mathematics and calculations basic to the use and measurement of radioactivity.*
4. *Biological effects of radiation.*
5. *Radioactivity measurement standardization and monitoring techniques and instruments.*
6. *Accident and incident procedures.*
7. *Procedures for nuclear gauge storage and transportation.*
8. *General safety precautions.*

Gauge Operation

1. *Instrument therory*
2. *Operating procedures*
3. *Maintenance*
4. *Field application*
5. *Gauge calibration*

CERTIFICATE #: 069833

ROBERT WILSON	8/24/95	WILLIAM F. TROXLER
INSTRUCTOR	DATE	PRESIDENT

February 6, 2001

Mr. Arden Scroggs
Washington State Department Of Health
Division of Radiation Protection
PO Box 47827
Olympia, WA 98504-7827

Dear Mr. Scroggs,

This letter is in response to your request for clarification or additional comment regarding my application for radioactive materials license, Licensing Action Number 96-01-05.

1) The approximate time spent on each of the major categories described in the "Nuclear Gauge Safety Training Program" manual follow the guideline set forth in the enclosed document "Nuclear Gauge Operator's Training Course Outline"

2) Copies of the indicated tests and answer sheets are enclosed

3) My training experience includes 6 years conducting training in "Statistical Process Control", "Total Quality Management", "Gauge Repeatability and Reproducibility", and "The Cost of Quality". This experience included authoring the course on Statistical Process Control, and co-authoring the course on Gauge Repeatability and Reproducibility. I have also taught classes on various software products, and in the use of sophisticated measuring instruments such as Optical Comparitors, Coordingate Measuring Machines, and vision (non-contact) measurement systems. Some of the better-known customers for these classes included The Boeing Company, Kenworth Trucks, Freightliner, Weyerhaeuser Company, Eldec, Varian, and Hewlett-Packard.

4) Certifying documents signifying my qualification as a Troxler Gauge Safety Instructor are attached.

If there are any other questions regarding this license application, please do not hesitate to contact me.

Sincerely,

Stephen R. Tucker

TROXLER

September 25, 1996

Mr. Arden C. Scroggs
Department of Health
Division of Radiation Protection
Airdustrial Park, Bldg. 5
P.O. Box 47827
Olympia, WA 98504-7827

Dear Mr. Scroggs:

This is to confirm that Mr. Stephen R. Tucker, having met all requirements specified in the Troxler Radiation Safety Manual, is authorized to be an instructor for the Troxler Nuclear Gauge Safety Training Course.

If you have any questions, please do not hesitate to call me.

Sincerely,

Stephen A. Browne

Stephen A. Browne
Corporate Radiation Safety Officer

cc: G. Hicks
S. Tucker

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NON PUBLIC
☐ Sensitive-Security Related
☐ Ass. Sec. Internal
☐ Other:

Reviewer: JRC Date: 7/24/14

Troxler Electronic Laboratories, Inc. • Troxler International, Ltd.

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