

WILLIAM H. RORER, INC.

FORT WASHINGTON, PENNSYLVANIA 19034 215-628-6000

RESEARCH DIVISION

April 17, 1985

License No. 37-08802-01
Docket No. 30-06195
Control No. 01760
Lester Tripp
Nuclear Materials Safety Section A
Division of Radiation Safety and Safeguards
UNITED STATES NUCLEAR REGULATORY COMMISSION
Region I
631 Park Avenue
King of Prussia, PA 19406

MS 16
K8

Dear Mr. Tripp:

As discussed in our telephone conversation of April 15, 1985, we wish to add the following to our letter of March 18, 1985:

1. Item 11 on the NRC application, Calibration of Radiation Detection Instruments.
 - A. Beckman Liquid Scintillation Counter, Model LS-350, Serial No. 0100077.
 - (1) ^{14}C standard, 30,900 DPM, #C243-U057.
 - (2) ^3H standard, 103,400 DPM, #H243-U129.
 - (3) Reference background, #N-848-A08.
 - B. Beckman Liquid Scintillation Counter, Model LS-7000, Serial No. 7702508.
 - (1) ^{14}C standard, 27,100 DPM, #C267011.
 - (2) ^3H standard, 118,000 DPM, #H269067.
 - (3) ^3H standard, 103,400 DPM, #H243-U028.
 - (4) Reference background, #B96718.
 - C. Both liquid scintillation counters are calibrated weekly, and, also when swipe tests and atmospheric monitoring tests are done. The sealed calibration standards are used to calculate counting efficiency.

CPM of standard
DPM of standard

X 100% Counting efficiency

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The counting efficiency (as a decimal) is used to calculate the DPM of all samples counted.

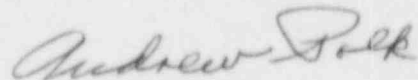
$$\frac{\text{CPM of sample}}{\text{Efficiency}} = \text{DPM of sample}$$

- D. All calibrations, swipe tests and atmospheric monitoring tests are carried out by the Radiation Safety Officer, Andrew Polk.
- E. The qualifications of the above named RSO are on file with the NRC. In summary, these are:
 - (1) Graduate Credit Course in Isotope Methodology - 1964, Hahnemann Medical College.
 - (2) Over 25 years in handling isotopes and radiation detection instruments.
 - (3) Radiation Safety Specialist Training Program - 1981, Oklahoma State University (see attached details of course).

We wish to express our thanks for the kind assistance of you and your staff.

If you require any further information, please do not hesitate to contact us at 628-6588 or 628-6382.

Sincerely,



Andrew Polk
Radiation Safety
Officer

AP/ral

Enclosures

Oklahoma State University



This is to certify that

ANDREW POLK

Has successfully completed the

RADIATION SAFETY SPECIALIST TRAINING

conducted by Oklahoma State University

and in recognition thereof is hereby awarded this certificate.

Given at Oklahoma City, *Oklahoma this* 13th *day of* March
in the year of 1981.



Howard M. Johnson

Howard M. Johnson, Ph.D., Instructor

Robert A. Weaver

Robert Weaver, Program Coordinator

Oklahoma State University

TECHNOLOGY EXTENSION

STILLWATER, OKLAHOMA 74078
313 CRITCHFIELD
(405) 624-5714

March 27, 1981

TO WHOM IT MAY CONCERN:

Andrew Polk has successfully completed the thirty-two (32) hour Radiation Safety Specialist Training Program and has passed the four (4) hour comprehensive examination given upon completion. This course was conducted by Oklahoma State University in Oklahoma City, Oklahoma, March 9-13, 1981, and consisted of the following topics:

- 1) Atomic and Nuclear Structure
 - a) Nuclear Notation
 - b) Nuclear Stability
 - c) Isotopes
- 2) Radioactive Decay
 - a) Decay Schemes
 - b) Half-Life
 - c) Chart of the Nuclides
- 3) Types of Radiation and Interaction
 - a) X and gamma
 - b) Alpha and Beta
 - c) Neutrons
 - d) Bremsstrahlung
- 4) Radiation Dosimetry
 - a) Absorbed dose: rad
 - b) Exposure dose: roentgen
 - c) Dose equivalent
 - d) Quality factor
- 5) Biological Effects of Radiation
 - a) Acute and chronic effects
 - b) Radiation and protection guides
 - c) Dose limits
- 6) External Radiation Protection
 - a) Time
 - b) Distance
 - c) Shielding
- 7) Internal Radiation Protection
 - a) Internal radiation hazards
 - b) Control of contamination
 - c) Waste disposal
- 8) Radiation Safety Instrumentation
 - a) Survey meters
 - b) Radiation scalers
 - c) Personnel dosimeters
- 9) Regulatory Control
 - a) Licensing procedures
 - b) Agreement and nonagreement states
 - c) Code of Federal Regulations
- 10) Compliance
 - a) Establishing and posting radiation areas
 - b) Surveying and wipe testing work areas
 - c) Leak testing sealed sources
 - d) Counting statistics
 - e) Transportation of radioactive materials

Successful completion of the above training and examination has demonstrated that Andrew Polk is competent to perform the following tasks which are expected of a Radiation Safety Specialist:

- 1) Use the Radiological Health Handbook and the Chart of the Nuclides.
- 2) Determine decay characteristics of a radionuclide from the Radiological Health Handbook and the Chart of the Nuclides.
- 3) Use standard calibration sources and perform DPM-Curie conversions.
- 4) Perform radioactive decay corrections.
- 5) Apply statistics to the counting of radioactive sample and express in correct form.
- 6) Use of the following instruments to perform area surveys and express reading correct units:
 - a) Geiger-Muller survey meter
 - b) Cutie Pie survey meter
 - c) Neutron survey meter
 - d) Alpha survey meter
- 7) Use of film badges, thermoluminescent dosimeters and pocket dosimeters for personnel dosimetry.
- 8) Calculate the dose rate from a (a) point gamma source, (b) point beta source, (c) point neutron source and (d) point beta source producing bremsstrahlung.
- 9) Perform shielding calculations on gamma, X-rays, beta, bremsstrahlung, and neutrons to reduce the dose to an acceptable level.
- 10) Use time, distance and shielding as a protective measure.
- 11) Perform leaks tests, wipe tests, and air samples, and determine if contamination is present and the amount.
- 12) Apply MPC values to a practical situation.
- 13) Establish a radiation safety unit within an organization utilizing:
 - a) Restricted areas
 - b) RSO
 - c) Radiation safety committee
 - d) Personnel monitoring
 - e) Area surveys
 - f) Leak tests
 - g) Wipe tests
 - h) Posting
 - i) Pertinent records
 - j) Radioactive storage and disposal
 - k) Receiving and shipping

3-31-81

Date

Howard M. Johnson

Howard M. Johnson, Ph.D.

Associate Professor

School of Technology

Oklahoma State University

4-2-85

TELEPHONE OR VERBAL CONVERSATION RECORD

TIME

3:15

☐ A.M.
☒ P.M.☐ INCOMING CALL☒ OUTGOING CALL☐ VISIT

PERSON CALLING

L. M. Tripp

OFFICE/ADDRESS

NRC R 1

PHONE NUMBER

EXTENSION

(215) 628-6000 5396

PERSON CALLED

Dr. Peter Kolberg

OFFICE/ADDRESS

Koor, Inc.
Fort Washington

PHONE NUMBER

EXTENSION

(215) 628-6000

CONVERSATION

SUBJECT

Response to deficiency letter

SUMMARY

Requested equipment & calibration procedures involved in counting wipe samples.
Information to be corrected in one(1) week

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REFERRED TO:

ACTION REQUESTED

ACTION TAKEN

☐ ADVISE ME OF
ACTION TAKEN.

INITIALS

DATE

INITIALS

DATE