



Alicia

Research &

Testing Labs, Inc.

QA, QC, NDE
Research and Development

Stafford Forge Road RRI Box 150 AA
West Creek, New Jersey 08092
(609) 296-0800

June 10, 1985

MS 16
K2

United States Nuclear Regulatory Commission
Region 1, 631 Park Avenue
King of Prussia, Pennsylvania 19406

Docket No.: 030-21248
Control No.: 103706

Attention: Jack Davis
Nuclear Materials Safety
Section A
Division of Radiation Safety

Gentlemen:

In accordance with our telephone conversation this date we submit clarification of our letter dated June 4, 1985 with reference to our application for a byproduct material license.

We clarify our "Corrective Action Taken" response as follows:

Item 2 Paragraph C "Field Examination" (Exhibit 1)

Response: Delete "Exhibit 1" and substitute the words "Radiation Safety Training Program - Radiographer Field Examination Test Paper" copy enclosed (20 questions).

Item 3 Previous Radiographic Experience (Radiographer)

Response: A) Six (6) hours classroom training.
B) Field Training Practical Test (20 questions).
C) Written Exam (similar to qualify Radiographer's Assistant - 25 questions).
D) Contact previous employer for verification of radiographer status.
E) Copy of Radiographer's NRC 5, NRC 4 forms completely filled out.

8507230315 850702
REG 1 LIC30
29-20838-01 PDR

03706
"OFFICIAL RECORD COPY"

JUN 13 1985

ML10

Item 5 Certificate of Calibration "Survey Meters"

Response:

C E R T I F I C A T E O F C A L I B R A T I O N

Survey Meters

Date:

Manufacturer

Electronic Test Model 773 Instrument
Calibration

Model Number

Serial Number

<u>RANGE</u>	<u>CALIBRATION POINT</u>	<u>ACTUAL READING</u>	<u>ERROR</u>
1. No. Attenuator	800 mr/hr	_____	_____
2. Add .25 Attenuator	200 mr/hr	_____	_____
3. Remove .25 Attenuator	80 mr/hr	_____	_____
Add .1 Attenuator		_____	_____
4. Add .1 Attenuator	20 mr/hr	_____	_____
Add .25 Attenuator		_____	_____
5. Add (2) .1 Attenuator	8 mr/hr	_____	_____
6. Add (2) .1 Attenuator	2 mr/hr	_____	_____
Add (1) .25 Attenuator		_____	_____

Repairs/Parts

The calibration and certification is in accordance with the Nuclear Regulatory Commission requirements of 10 CFR Part 34 Regulations.

The above instrument was calibrated with a Cesium 137 Source - NRC Regulations require that it be recalibrated not later than 3 months.

Calibrated by: Radiation Safety Officer/Radiographer

ALICIA RESEARCH & TESTING LABS, INC.

By _____

03706



June 10, 1985
Page 3 of 5
N.R.C. Letter

Item 6 Certificate of Calibration "Pocket Dosimeters

Response: Pocket Dosimeters will be calibrated by the Dosimeter Calibrator
Model 3060

C E R T I F I C A T E O F C A L I B R A T I O N

Client:

Date:

Manufacturer

Test Media: Dosimeter Calibrator
Model 3060

Model Number

Serial Numbers

<u>CALIBRATION PROCEDURE</u>	<u>CALIBRATION POINT</u>	<u>ACTUAL READING</u>	<u>ERROR</u>
Inner Holes	50 mr/hr in six (6) hours	_____	_____
Outer Holes	50 mr/hr in 24 hours	_____	_____

Repairs/Parts

The calibration and certification is in accordance with the Nuclear Regulatory
Commission requirements of 10 CFR Part 34 Regulations.

The above pocket dosimeters were calibrated with a Cesium 137 Source - NRC
Regulations require that calibration be performed at least once every three (3)
months.

Calibrated by: R.S.O./Radiographer

ALICIA RESEARCH & TESTING LABS, INC.

By _____

Item 7 "Excessive Radiation Exposure to Personnel"
 7.5.1.B

Response: Delete reference to adults. Add - Radiographers in a restricted area to be limited to 1.25 rem per calendar quater, unless N.R.C. form is completed.

Item 10 Radiation Safety Internal Audit Form

Response: Delete Exhibit 1 from Corrective Action Taken

Substitute AR&T Labs Radiation Safety Internal Audit Form No. ART-262.

RADIATION SAFETY INTERNAL AUDIT FORM

INDIVIDUAL:		LOCATION:		DATE:	
REFERENCE		DESCRIPTION OF AUDIT POINT	SAT.	UNSAT	REMARKS
10 CFR 19					
Notices, Instructions and Reports to Workers	1	Posting of Notices to Workers			
	2	Instructions to Workers			
	3	Notifications & Reports to Workers			
10 CFR 20	4	Surveys			
Standards for Protection Against Radiation	5	Personnel Monitoring			
	6	Signs, Labels, Signals & Controls			
	7	Records of Surveys & Monitoring			
	8	Notification of Incidents			
	9	Reports of Overexposure & Excessive Levels of Radiation			
	10	Personnel Exposure & Monitoring Reports			
	11	Notifications & Reports to Individuals			
10 CFR 21	12	Provisions for Reporting			
Reporting of Defects and Incompliance	13	Maintenance of Report Log			
	14	Corrective Action Process			
10 CFR 30	15	Applications for License Renewal			
Rules for Licensing	16	Radiation			
10 CFR 34	17	Locking of Exposure Devices			
Radiography and Radiation Safety	18	Storage Precautions			
	19	Radiation Survey Instruments			
	20	Leak Testing & Tagging of Sources			
	21	Source Inventory			
	22	Utilization Log			
	23	Inspection & Maintenance of Equipment			
	24	Training			
	25	Operating & Emergency Procedures			
	26	Personnel Monitoring			
	27	Security & Posting of Signs			
	28	Radiation Surveys & Records			

ART-262⁹

Item 4 "Radiation Detection Instruments"

Response: Dwg ART-0002 (Alarm System) indicates entrance door not shown.

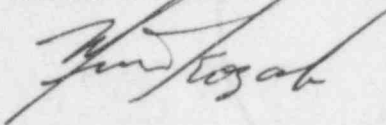
Entrance door has been installed with an interlock system, so that if door is opened this action will activate the audible and visual warning systems.

The area monitor system as shown on the drawing is a secondary method of audible and visual alarm system when the light beam is broken by unauthorized entry.

We trust that the above responses will clear up any misunderstandings created by our reply dated June 4, 1985 to your letter of recommendations dated May 22, 1985.

Sincerely,

ALICIA RESEARCH & TESTING LABS, INC.



Michael Kozak
President

MK/krs

Attachments: Chart Model 773 Instrument Calibration
Dosimeter Calibrator Model 3060
Item 8 Radiographer Field Test

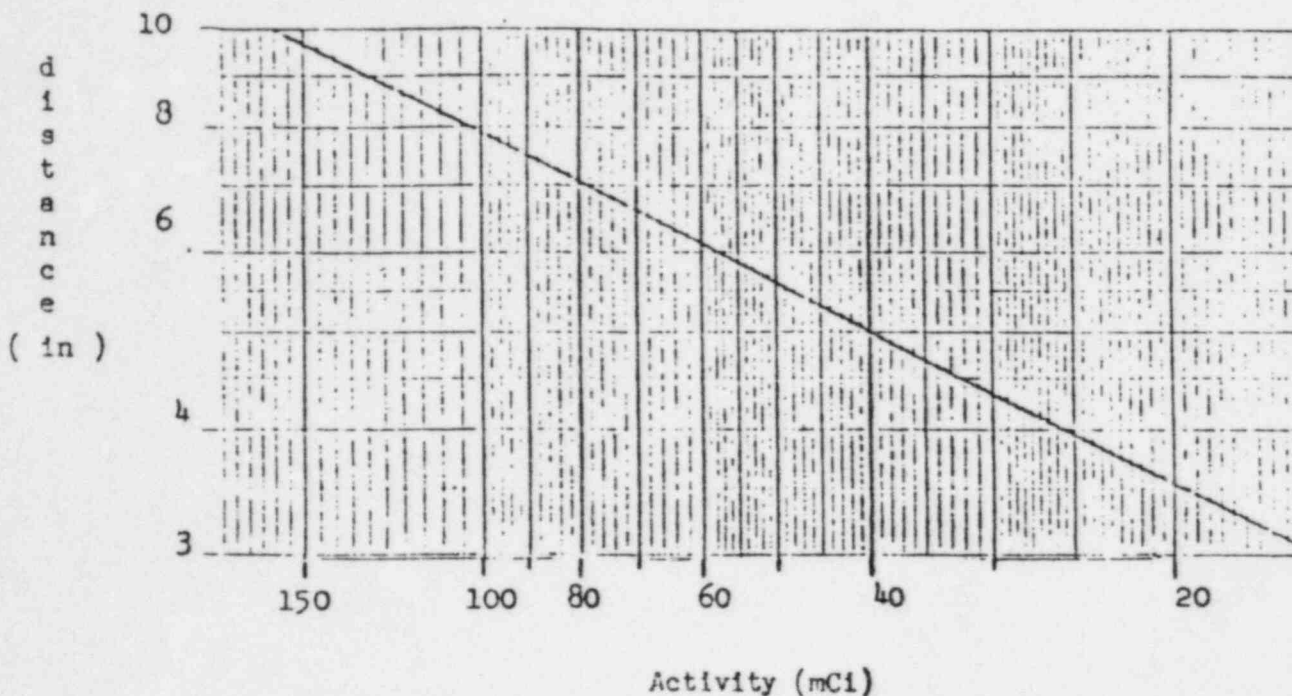
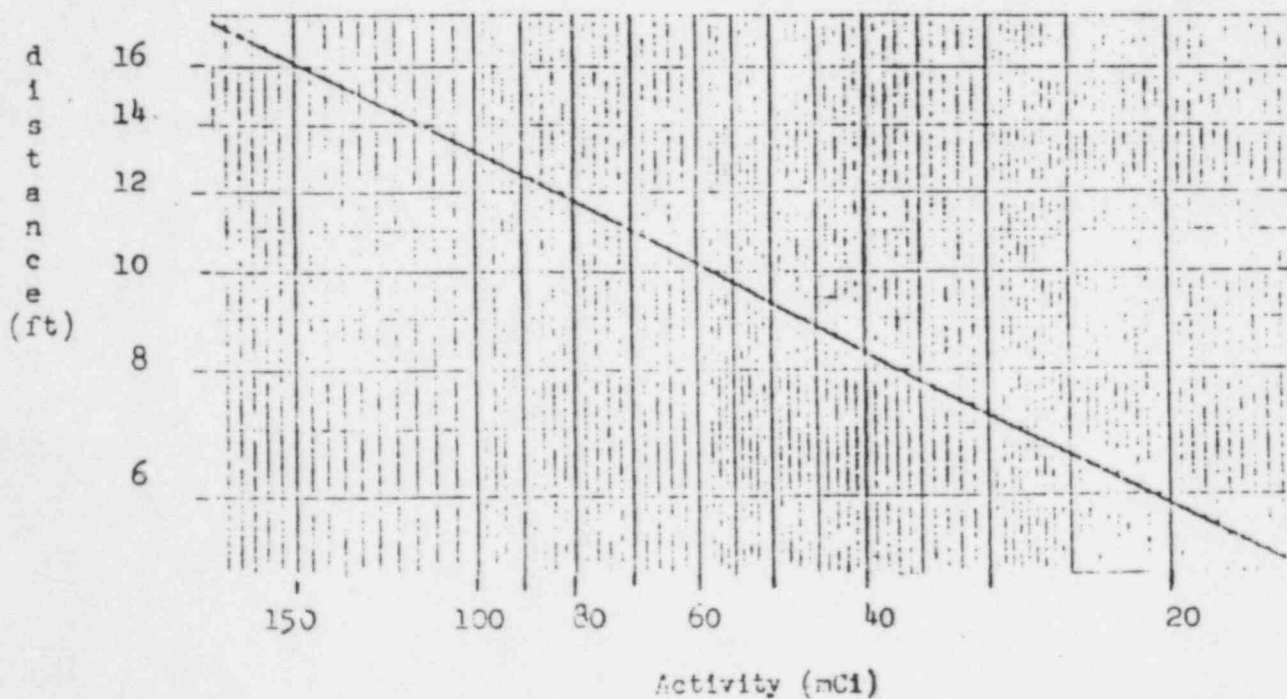


Figure 3

Distance to 800mR/hr isodose line as a Function of Activity



Distance to 2mR/hr isodose line as a Function of Activity

Figure 4

03706

dosimeter

Desk Top Dosimeter Calibrator

The Convenient Calibrator

Model 3060 dosimeter calibrator, with 4 and 8 hole rings around the source:

- Permits quick accuracy verification of dosimeters.
- Can be used with all common brands of dosimeters.
- Is designed for 200mR and 500mR dosimeters.
- Requires no (specific) NRC license.
- Has radiation levels outside of the case so low that it can be left on your desk.
- Is effectively labeled to ensure radiation source awareness by all viewers.



- Has special base indents guaranteeing correct dosimeter positioning, thus allowing highest reproducibility.
- Can be used as a teaching aid for studies on reproducibility of readings, self-shielding, inverse square law, etc.



Conveniently available on your desk when there is a question about a dosimeter functioning properly.

Dosimeter Calibrator

Model 3060



SPECIFICATIONS



I. OPERATING CHARACTERISTICS

Environmental Conditions

Temperature Range
Relative Humidity

0°F - 120°F (- 18°C - 49°C)
Up to 98%

Radiation Levels

Inner Holes
Outer Holes

- 50mR in 6 hours
- 50mR in 24 hours

II. PHYSICAL CHARACTERISTICS

Calibration Holes Mechanical

Case
Finish
Dimensions
Diameter
Height
Net Weight
Shipping Weight

Aluminum
Black anodized

1 (inner) ring of 4 holes and 1 (outer) ring of 8 holes

4" (10.1 cm)
2-7/16" (6.25 cm)
300 g. (11 oz.)
1 lb. (500 g.)

APPLICATION FOR MATERIAL LICENSE

ITEM #8

20 SAMPLE TEST QUESTIONS/ANSWERS

RADIOGRAPHER

FIELD TEST

SAMPLE FIELD TEST QUESTIONS FOR RADIOGRAPHERS (AND ACCEPTABLE ANSWERS)

1. What isotope source is AR&T Labs licensed to use for field operations and where is it stored at the laboratory?
 - A) Iridium 192, Model 660
 - B) Stored in vault located in floor of exposure room and locked with padlock.
2. Who has the key to the storage vault?

The Radiation Safety Officer
3. What safety equipment do you use when working with isotopes in the field?

Film Badge
Pocket Dosimeter (set at zero)
Calibration Survey Meter
Copy Operating/Emergency Procedures
Copy NRC Part 19, 20, 34
4. What documents do you fill out before you leave for a field operation?
 - A) Utilization Log
 - B) Storage Container Log
 - C) Collimator Log
5. When you place projector and camera in vehicle for transportation to field site, what precautions do you take?
 - A) Make sure camera is fully checked.
 - B) Remove locking key from camera housing.
 - C) Place "Radioactive" signs on all four sides of vehicle.
 - D) Survey vehicle from all sides, record data, especially driver position, so that radiation level will not be greater than 2 mr/hr.
6. Who makes the decision governing the number of men to be used in a field site application?

The Radiation Safety Officer
7. List the following items on a checkoff list to be taken on every field application:
 - A) A minimum of two (2) calibrated survey meters.
 - B) Assigned film badge and pocket dosimeter at zero position.
 - C) A minimum of 200' yellow-magenta rope.
 - D) A minimum of 12 "Caution Radiation Area" signs.
 - E) A minimum of 12 "Caution High Radiation" signs.
 - F) A minimum of 4 "Caution Radioactive Materials" signs.
 - G) Survey Forms.

7.
 - H) Report Forms.
 - I) Copy of NRC License.
 - J) Copy of Operating and Emergency Procedures.
 - K) Part 20, Part 34, Part 19
 - L) Lead Collimators, choice of 3, depending on the application.
 - M) Copy of AEC - 4
8. When you arrive at the field site, what is the first thing you do?

Survey motor vehicle to determine any change in Radiation Level.
9. What is the next thing you do as a Radiographer at the field site?

Survey the job site and decide where to rope off areas and placard signs so that immediate shooting area becomes a "Restricted" area.
10. Who has the responsibility not to accept field site applications unless radiation levels can be controlled to acceptable limits?

The Radiation Safety Officer
11. Describe the Operating Procedure
 - A) Unlock the camera by turning the key in the housing.
 - B) The entrance port will open so that you can connect the cable from the 25' reel housing and roll out the crank reel.
 - C) Turn the lock dial to "Expose".
 - D) Take position at 21' end of remote cable and turn hand crank counter-clockwise with smooth even motion. When you feel source cable in stop position an exposure is being made.
 - E) Set timer for exposure time, survey roped off area. This is now a restricted area.
 - F) Maintain surveillance of perimeter of exposure site to prevent an unauthorized entry.
 - G) The perimeter of exposure site should not read more than 2 mr/hr.
 - H) When the exposure has been completed, retract the Iridium 192 source by turning the hand crank clockwise.
 - I) With survey meter in hand, survey guide tube and exposure device to make sure source is safely back in container. Check pocket dosimeter. There should be no indication of radiation.
 - J) Turn exposure device key to lock position. Remove exposed film. Prepare for next exposure.
 - K) After last exposure is made, monitor source tube to make sure source is back in exposure device housing. Turn key to lock position.
 - L) Disconnect source tube cable and replace shipping plug into receptacle for locking device.
 - M) Disconnect crank cable and lock unit.
 - N) Return exposure device to vehicle.
 - O) Record pocket dosimeter readings in utilization log book.

12. In the event field application requires overnight stay at job site, is there an alternate storage facility?

You can lock exposure device in a temporary storage area with "Caution Radiation Materials" signs on storage door, locked with key in your possession.

Notify job management where you will be sleeping so that they can contact you in an emergency.

13. Describe the procedure for making an exposure:

- A) Survey site to insure that radiography may be safely performed.
 - 1) Clear areas.
 - 2) Advise cognizant personnel of intent to perform radiography.
- B) Place "Caution High Radiation" signs at or inside of the 100 mr/hr area. Place "Caution Radiation Area" signs outside perimeter of safety zone (2 mr/hr). Blinking lights may also be employed.
- C) Align source tube and unit with collimator.
- D) Survey area to determine presence of background radiation.
- E) Expose source
- F) Survey area to determine 2 mr/hr levels.
- G) Return source to safe monitor guide tube and safe.
- H) Post signs, barricades, guards, and other warning devices as applicable.
- I) Prepare exposure (place film, etc.).
- J) Crank out exposure.
- K) Re-survey area.
- L) Return source to safe at completion of exposure.
- M) Check guide tubes and safe with survey meter and secure unit.
- N) Complete job survey record card.

14. In the event of an accident during transportation of radioactive materials describe the procedure:

- A) All personnel shall be immediately cleared out of accident area.
- B) Radiographer will survey accident area and establish a safe perimeter with a reading of 2 milliroentgens or less beyond which all personnel shall remain.

15. What do you do if the survey meter is not operating due to the accident?

Determine safe perimeter of the accident by means of calculations based on the source strength he is transporting and the decay factor.

16. If the radioactive containers are undamaged, can they be safely moved?

yes

17. In the event of an accident, the Radiographer will notify the following:

- A) Technical Operations, Toll Free 1-800-225-1383
- B) Local Police Department (if necessary) to keep order
- C) Radiation Safety Officer
- D) Local Police/Fire Department as to location of radioactive sources
- E) Nuclear Regulatory Commission
- F) Emergency Radiation Officer

18. List the emergency telephone numbers:

- | | |
|-------------------------------|--------------------------------------|
| A) Michael Kozak 609-698-2780 | D) Martin Oberstaedt 609-693-8782 |
| B) Jack Miller 718-891-3038 | E) NRC 215-337-5250 |
| C) James Murphy 609-296-7279 | F) Technical Operations 800-225-1383 |

19. Is there a procedure for performing Field Site Operations?

Reference AR&T Labs Operating and Emergency Procedures

20. How do you know what is the source strength of the Isotope in your possession?

Reference "Isotope Decay Chart"

03706