ISOMEDIX

May 24, 1977

U.S. Nuclear Regulatory Commission
Div. of Materials and Fuel Cycle
Facility Licensing
Washington, D.C. 20555

License Number
29-05364-01 and -02

Gentlemen:

Re: License Number
29-05364-01

In accordance with paragraph 16, Amendment 06 to the subject license, we are enclosing a radiation level survey report. On May 3, 1977, we increased the cobalt-60 curie content of the irradiator to 990,000 curies. Readings were taken with an Eon Meter (0-50 mr/hr), calibrated in April 1977.

In view of the readings, it is requested that the authorized level of cobalt-60 for this unit be increased from one million to two million curies.

It is also requested that the authority to designate operators for this unit be delegated to the undersigned, rather than wait for specific approvals from NRC with corresponding license amendments. The procedure for qualifying an individual as an operator would remain as outlined in our license, i.e.,

a. A 10 hour semi-formal course in radiation administered by the undersigned or the Assistant RPO, Mr. Y. Doyle, using the AEC publication "Living With Radiation". The course includes instruction on radiation theory, hazards, instrumentation, personnel monitoring, and safety.

b. On-the-job training in the irradiator, including its operational and safety systems, operating procedures, maintenance, and product processing procedures. The time duration for this phase is dependent on the individual. Training periods have ranged from one to six months.

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INSPECTION AND ENFORCEMENT

Isomedix Inc. • 25 Eastmans Road, Parsippany, New Jersey (201) 887-4700
Mailing Address: Post Office Box 177, Parsippany, New Jersey 07054
CHICAGO DIVISION • 7828 Nagle Ave., Morton Grove, Illinois 60053 (312) 966-1160

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c. At the conclusion of a and b, the trainee is given a written test, which must be passed with a score of 75%. He also is required to demonstrate his operational capability in a successful manner.

We would propose notifying NRC by letter when a specific individual has been given operator status. The effective date of this status would be the date of the notification letter.

Copies of the semi-formal course outline and written test are enclosed.

Regarding 29-05364-02

As in the above, the same authority for Isomedix to designate operators for the -02 license is requested, with one exception: Operator designation can be authorized by Mr. O. Wolford, the on-site plant manager and Radiation Safety Officer, with the written approval of the undersigned.

Very truly yours,

George R. Dietz
Radiation Protection Officer

Enc.
GRD:km

cc: U.S. Nuclear Regulatory Commission
Region I
Office of Inspection and Enforcement
631 Park Avenue
King of Prussia, Pa. 19406

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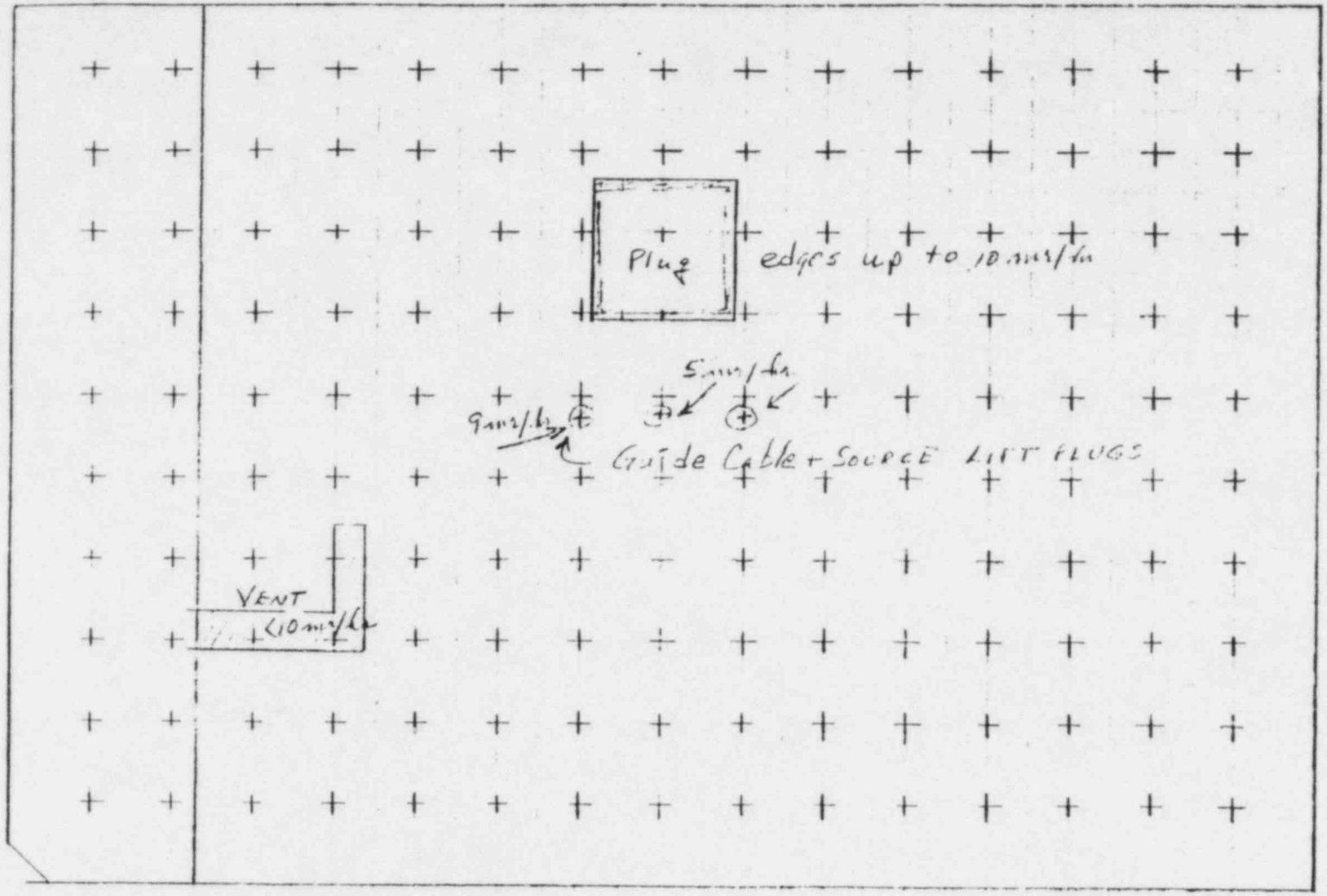
T. P 1/4" = 1.5' ISOMEDIA

← NORTH



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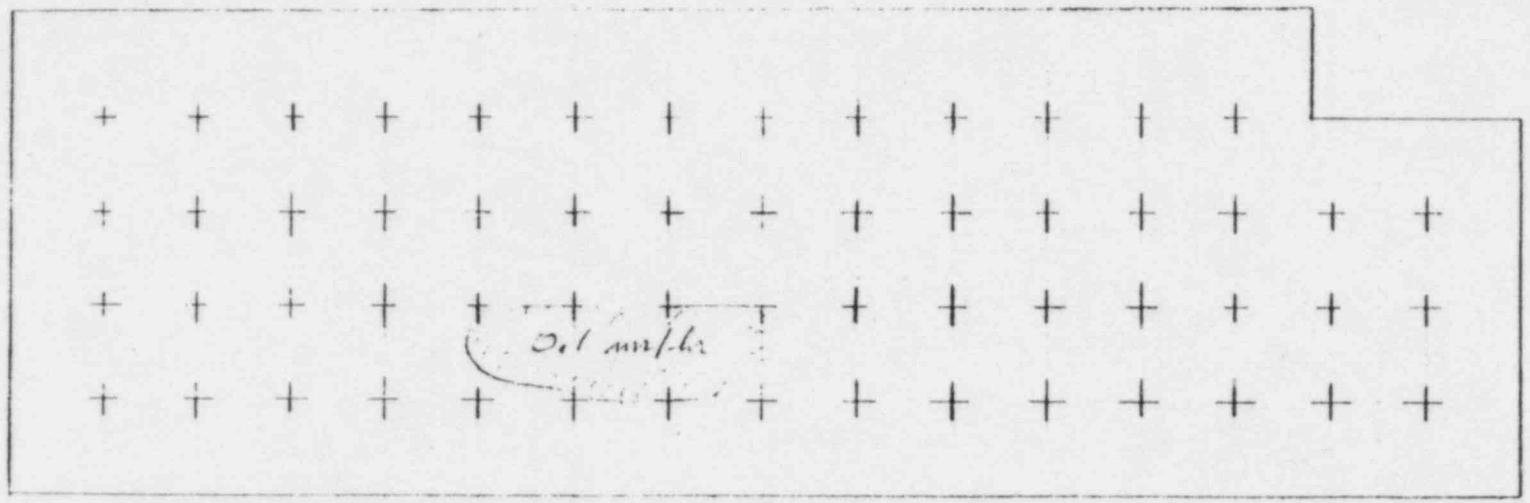
All readings less than 1.0 milli rad - except as noted.

EAST WALL

1/4" = 1.5'

ISOMETRIC



All readings less than 0.1 mm/hr

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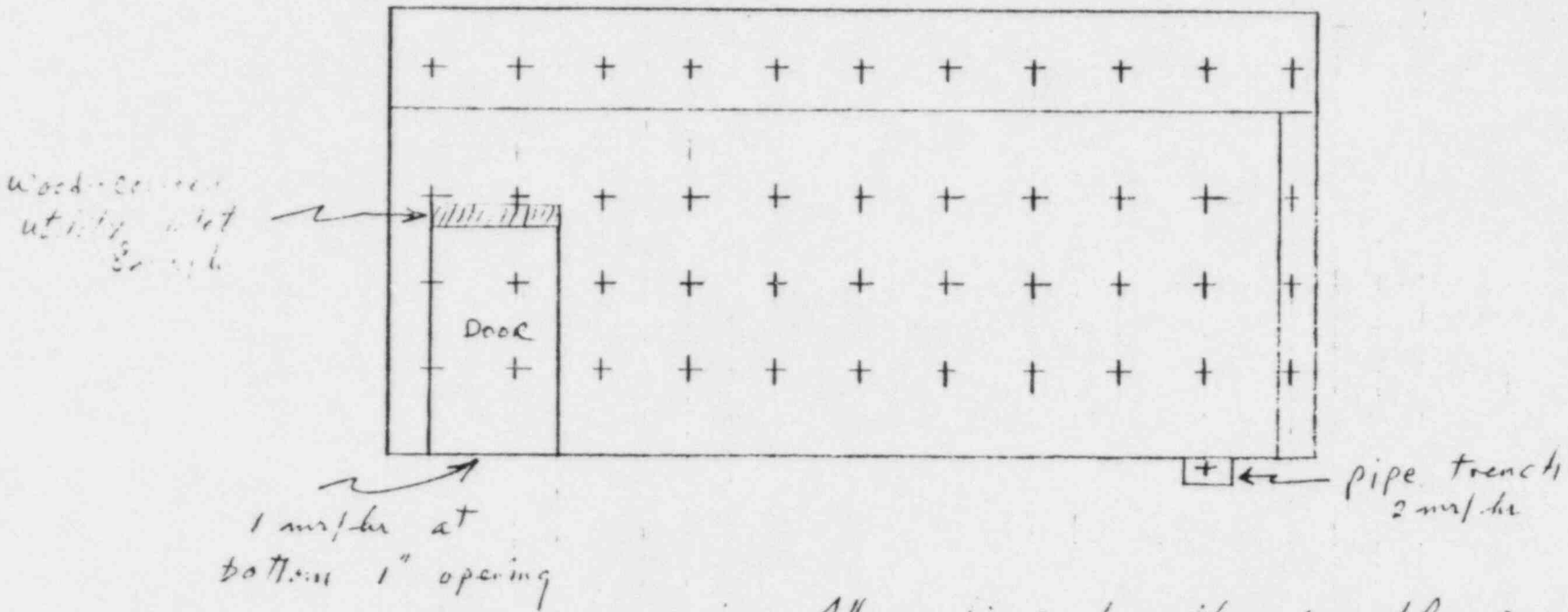
NORTH WALL

1/2" = 1.0'

ISOMETRIX

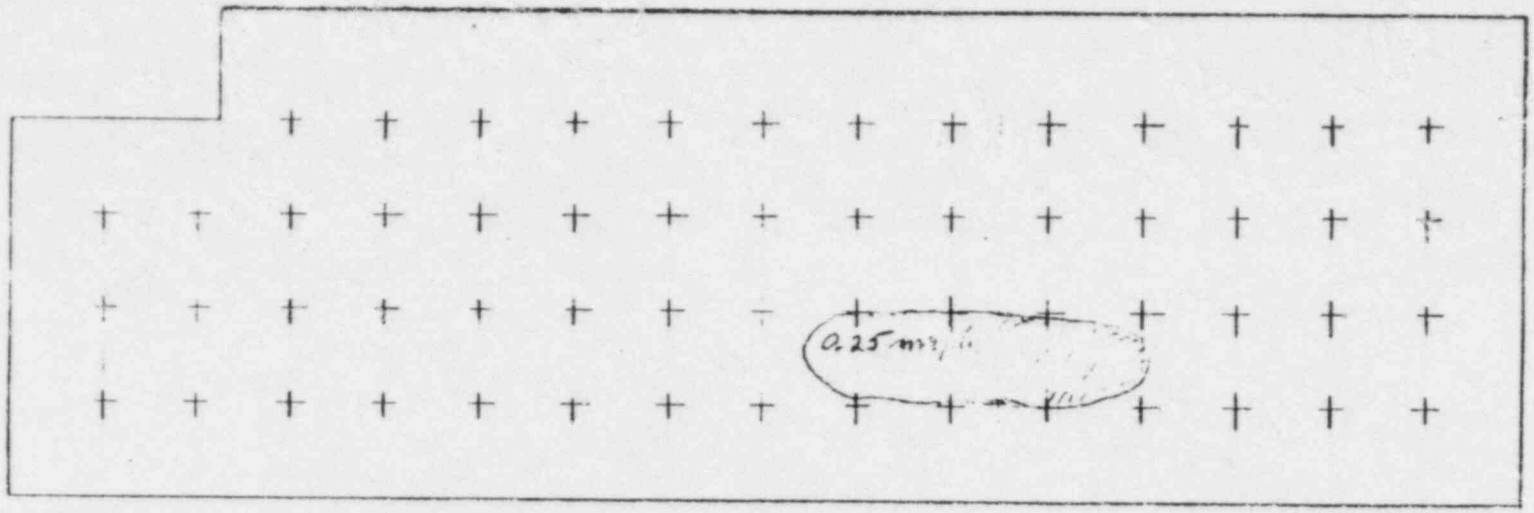


All readings less than 1 mr/hr except as noted.

990,000 ci
5-6-77

West Wall
1/4" = 1.5'

Isomedix



All readings less than .1 mr/hr
except as noted

99,000 cc 6.60
5-6-77

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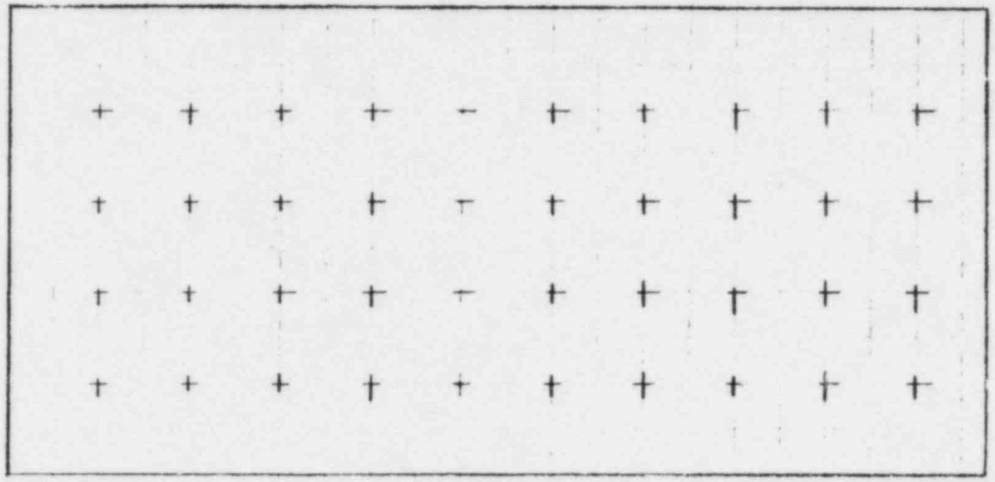
South Wall

1/4" = 1.5'

Isometrix



All readings less than .1 mr/hr

990,00

CONTENTS OF TRAINING PROGRAM	HOURS
1. The Hazards of Radiation Unavoidable low level exposure Hazard evaluation.	½
2. The Effects of External Radiation a. Effects on the body b. Units of measurement c. Levels of injury d. Long term exposures e. The banking concept	1
3. Protection from External Radiation a. Time b. Distance c. Shielding materials d. Define curies and half value layers, dose rate curves in the Isomedix irradiator.	1
4. Radiation Physics The Nucleus-isotopes-radioactive decay	1
5. Internal Radiation Problems a. How radioactive material enters the body. b. Effects on the body.	1

6. Contamination 1

a. Hazards associated with contamination.

b. Prevention of spread.

c. Decontamination procedures.

7. Instruments and Dosimetry 1

a. Geiger Counters.

b. Ionization chambers.

c. Scintillation counter.

d. Film Badges.

e. Pocket Electroscopes.

8. Review of Isomedix Facilities and Procedures 2

a. Source interlock systems.

b. Operating procedures for routine irradiation.

c. Operating procedures for hot cell operations.

9. Verbal Discussion on the Above Course 1

Questions to determine understanding of all the topics.

Total Hours 9½

The AEC publication, "Living with Radiation" was used as a basis for this training.

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EXAMINATION

FOR

OPERATOR QUALIFICATION

1. Name the three common types of radioactive decay emissions.

2. Of the three emissions from Question (1), cobalt-60 emits the highly penetrating _____.

3. Cobalt-60 emits energy which (circle correct answer(s):

   a. Can make other materials radioactive.
   b. Can damage living tissues.
   c. Can penetrate only the human skin.
   d. Is identical to X-rays, except for the mechanism by which they are "born".

4. Regulatory agencies allow upper limits of exposure for licensed, badged personnel working in radiation areas. The acceptable yearly level, if radiation history is unknown, is

   a. 12 rem.
   b. 5 rem.
   c. 25 rem.
   d. 500 rem.

5. True or False (circle)

   It is far more detrimental to the body to receive a 3-rem dose over a two-hour period as opposed to over a three-year period.

6. The normally accepted dose of whole body radiation, over a short period, at which about 50% of the population would die, is _____ rem. Below _____ rem, there are no physical detectable effects.

7. A 30-year old worker joins the staff as an authorized worker around radiation. In has past work, he has received a total whole body exposure of 2-rem. Under the "banking" concept, how many rems should remain to his "credit"? _____

8. Can this worker use up all of his "credit" within the next three years? Yes _____ No _____.

9. Define the term "rad".

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10. High personnel exposures could cause genetic effects. What are genetic effects?

11. What are the three best means of protection from external exposure?

12. The dose rate at one foot from a source is 160,000 rads per hour. What is the dose rate at four feet?

13. How often should you zero your pocket dosimeter?

14. When are the pocket dosimeter and film badge worn?

15. You are on duty at night and the source automatically drops before the entire cycle is over. However, the access door to the irradiator will not open because the alert radiation light is lit. Perhaps the light has malfunctioned. Your correct course of action is to:

    a. Unscrew the light and enter the cell normally.
    b. Wait until the next shift arrives.
    c. Call the Radiation Protection Officer.
    d. Try to bypass the alarm and enter the chamber very carefully with a hand-held meter.

16. It is necessary to enter the irradiation chamber. You make a test check of the hand-held monitor, and find that you get no reading response. What action do you take?

17. A group of important looking visitors arrives unexpectedly at night and would like to go into the irradiation chamber to see the mechanism. The Radiation Protection Officer is temporarily absent and is expected to return in three hours. What do you do?

18. While you are working in the control room, you hear strange scraping sounds coming from the irradiation chamber. What is your first action?

19. Irradiation causes a toxic gas to be formed inside the irradiation chamber. What is it called?

    If you enter the irradiator and the odor is very noticable, what is your action?

20. In any type of actual or suspected radiation emergency, what is your first action?

21. If a source were to leak or rupture, airborne or waterborne contamination could occur. Name at least two procedures which could give early warning of trouble.

22. In an actual personnel overexposure, where you are quite sure a person has received an overdose, who are the three persons or agencies to contact immediately?

23. An overexposed person will shown physical signs which might give a clue to the dose he received. Match the following doses and symptoms:

25 rem	Nausea, fatigue
100 rem	Unconscious, shock
1000 rem	No detectable effect

24. Can cobalt-60 irradiation of a person make him radioactive for a short time?

25. The Parsippany Irradiator (Cell 3) is a production unit which is expected to operate on a continuous basis. Its primary and only function is to process. Only one consideration is more important. What is it?

ANSWERS TO SAMPLE EXAMINATION FOR OPERATOR QUALIFICATION

1. Alpha, Beta, Gamma
2. Gamma
3. b and d.
4. b.
5. True.
6. 500 and 25 respectively.
7. 58
8. No.
9. The absorption of 100 ergs per gram of energy.
10. Effects on future generations (such as mutations) which may be caused during or after conception, until birth.
11. Time, distance and shielding.
12. 10,000 rad/hr.
13. Whenever the reading exceeds 15 mrem at the beginning of the work tour.
14. At all times when on duty.
15. c.
16. Any of the following:

    a. Call Radiation Protection Officer. Do nothing until he advises.
    b. Take the spare meter.
    c. Replace batteries in the first meter; make sure it responds; then proceed.

17. Politely refuse entry of the visitors past the office/reception area.
18. Lower the source.
19. Ozone. Leave the cell for 2-3 minutes, then re-enter.
20. Call the Radiation Protection Officer.

(Answers to sample examination for Operator qualification - cont'd.)

21. Source wipe test.
Monitoring of water treatment system.
Smearing walls, floor, vent, in cell.

22. a. Hospital or emergency squad.
b. Radiation Protection Officer.
c. NRC, Region I.

23.

25 rem	No detectable effect
100 rem	Nausea, fatigue
1000 rem	Unconscious, shock

24. No

25. Safety

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 3 1977

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FCTR:JEJ
71-9013
29-15364-01

Isomedix Incorporated
ATTN: Mr. George R. Dietz
Post Office Box 177
Parsippany, New Jersey 07054

Gentlemen:

Enclosed is Certificate of Compliance No. 9013, Revision No. 0, for the Model No. 521 shipping package. This certificate supersedes, in its entirety, Amendment No. 71-1 to Byproduct Material License No. 29-15364-01, dated April 18, 1974.

Isomedix Incorporated and the U.S. Department of Agriculture have been registered as users of this package under the general license provisions of Paragraph 71.12(b) of 10 CFR Part 71 or 49 CFR §173.393a.

This approval constitutes authority to use this package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR §173.393a.

Sincerely,

Charles E. MacDonald, Chief
Transportation Branch
Division of Fuel Cycle and
Material Safety

Enclosure:
As stated

cc: w/encl
Mr. Alfred W. Grella
Department of Transportation

U.S. Department of Agriculture
ATTN: Mr. C. Z. Kwast
Agriculture Research Center
Beltsville, Maryland 20705

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