



KERR-McGEE CORPORATION

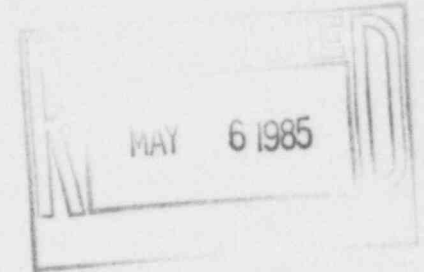
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

May 1, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Jack Whitten
Material Radiation Protection Section
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011



Re: Amendment Request
Byproduct Material License 35-12636-03

Dear Mr. Whitten:

It is planned to purchase an additional cesium source to be used at the Sequoyah Facility in Gore, Oklahoma, requiring an amendment to the referenced license.

Will you please amend Conditions 6, 7, 8, and 9 in the following manner:

6.G.	7.G.	8.G.
Cesium-137	Sealed Source (Technical Operations Model 77302)	Not to exceed 165 mCi per source

9.G. For use in Technical Operations, Inc. Model 773 Calibration Kit for instrument calibration.

A copy of the specification sheet for the device is attached. Check number 040842 in the amount of \$60.00 is also attached as payment of the amendment fee.

All other conditions of the license will remain unchanged.

Sincerely,

M. Landagora
Maybelle Landagora
Environmental Analyst
Nuclear Licensing & Regulation

ML/br

Attachments: As Stated (2)

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RE94 LIC30
35-12636-03 PDR

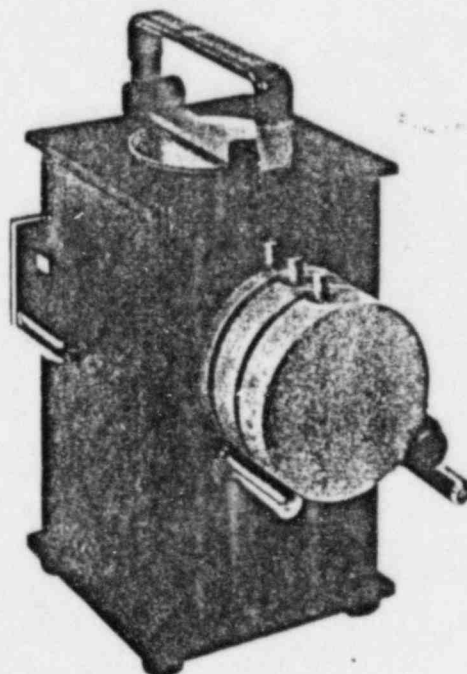
RECEIVED BY LFMB	
Date	5/13/85
By	Apr 6 IV
By	Brown
Date	5/14/85
Action	

Applicant	040842
Check No.	603P
Amount/Fee Category	Amendment
Type of Fee	5/13/85
Date Check Rec'd	B. Naim
Received By	

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Tech/Ops Model 773 Instrument Calibration Device Operation Manual



TECHNICAL OPERATIONS, INC.
Radiation Products Division
Burlington, Mass. 01803
Phone (800) 225-1383 (toll free)
[in Mass. call (617) 272-2000]

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WARRANTY
AND
LIMITATION OF LIABILITY

Technical Operations, Incorporated (hereinafter referred to as *the manufacturer*) warrants its product which it manufactures and sells to be free of defects in material and workmanship for a period of 1 year from date of shipment. This warranty shall not apply to any product or parts which have been subjected to misuse, improper installation, repair, alteration, neglect, accident, abnormal conditions of operations, or use in any manner contrary to instructions.

The manufacturer's liability under such warranty shall be limited to replacing or repairing, at its option, any parts found to be defective in such respects, which are returned to it transportation prepaid; or, at its option, to returning the purchase price thereof.

The warranty on other manufacturers' components shall be that of the original manufacturer whose warranty shall be binding.

In no event shall the manufacturer be liable for any incidental or consequential damages, whether or not such damages are alleged to have resulted from the use of such product in accordance with instructions given by or referred to by the manufacturer.

Technical Operations, Incorporated assumes no liability or responsibility for the usage of any radioactive material used in connection with this product.

All other warranties, except those warranties expressly stated herein, including warranties of merchantability or otherwise, are expressly excluded.

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Technical Data

Size: 5 in (12.7 cm) wide, 5 in (12.7 cm) deep, 8.5 in (21.6 cm) high
Weight: (with attenuators) 52 lbs. (24 kg)
(without attenuators) 45 lbs. (20 kg)
Source: Model 77302, ¹³⁷Cesium, ~~150~~ 165 millicuries
Transport Status: DOT Specification 7A Type A Package
Shielding Material: Lead Approx. 29 lbs. (13 kg)

General

165 The Model 773 is a small, portable radiation survey instrument calibration device. The unit consists of a ~~150~~ millicurie ¹³⁷Cesium source permanently attached to a movable source rod which is installed in a lead shield casting. The source is exposed by raising the source rod which positions the source in a 36° x 20° collimated beam port.

The unit is equipped with three attenuators (Transmission of 0.25, 0.10 and 0.10) to allow a survey instrument with three ranges to be calibrated at 20% and 80% of each range without changing the position of the survey instrument. The Model 773 can be used to calibrate survey instruments with ranges up to 2000 milliroentgens per hour.

The unit is equipped with a carrying handle which also serves as a source locking bar to prevent unauthorized use of the calibrator. A shipping cover is also attached to provide and additional means of securing the source.

Receiving

Survey the device for excessive radiation levels. The device should have radiation levels less than 200 mR/hr at the surface and less than 10 mR/hr at three feet from the surface. Inspect the device for shipping damage and insure that the device is locked.

Safety Precautions

The Model 773 Meter Calibration Device contains a ~~150~~ millicurie ¹³⁷Cesium source that
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emits gamma radiation which can cause injury if improperly used. Disassembly of the device or removal of the source requires special equipment. We recommend that any service requiring disassembly of the device or removal of the source be performed by the manufacturer.

Instrument Devices

Although the device has radiation levels which are well below the maximum radiation level permitted on storage containers, personnel should not stay close to the device any longer than necessary.

Precautions should be taken to store the instrument calibration device in an area that meets the requirements of Title 10 Code of Federal Regulations 20.202(b) (2), 20.203(b) and 20.203(e).

It is recommended that personnel operating the equipment use a calibrated and operable survey instrument and wear appropriate personnel monitoring devices. The radiation level at the source rod when the source is in the "operate" position is approximately 50 milliroentgens per hour.

Movement of the source rod should be accomplished as expeditiously as practicable. An alternative method of raising the source rod would be the use of a string and pulley arrangement.

In no case should anyone enter the area of the radiation beam or expose any part of his body to the radiation beam.

Preparation for Use

Place the source shield in a restricted area so that the directional port is aimed horizontally. To minimize the effects of scattered radiation, the unit should be 16 feet from any wall in the direction of the primary beam.

Position a support horizontally from the Model 773 Instrument Calibration Device as shown in Figures 1 and 2.

Restrict access to the area where the radiation level is in excess of 2 milliroentgens per hour. (See Figure 4).

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Operation

Note: To properly calibrate a survey instrument it is necessary to check the instruments response at two points on each of the instruments ranges. These points must be separated by at least 50% of the full scale reading. The instruments reading should agree with the actual radiation intensity within 10% to be in proper calibration.

The following procedure is designed for a survey instrument with three scales and a range of 0-1000 mr/hr. For instruments with different ranges, the procedure will be similar but the points will differ.

1. Turn on the survey meter and allow it to "warm up" for approximately 10 minutes.
2. Determine the activity of the source on the date of calibration from the decay chart provided with the source.
3. Determine the distance from the source at which the radiation intensity would be 800 mr/hr (use Figure 3).
4. Using the tape measure attached to the Model 773, place the survey meter such that the axis of the detector is located at the proper distance from the source as determined above.

Note:

The survey meter should be located so that the center of the detector is at the correct distance and centered on the center line of the radiation beam. The axis of the detector should be perpendicular to the centerline of the radiation beam. Depending upon the physical size of your survey instrument, it may be necessary to mount it somewhat higher than the bench surface. When the proper geometry for your instrument has been established, use the same physical arrangement consistently in future calibration operations.

At short distances, using survey instruments with large detector volumes, the radiation intensity will not be uniform across the detector. Consideration should be given to this effect when determining the radiation intensities to be checked.

5. Unlock the handle of the Model 773. Re-

move the shipping plate. Remove all the attenuators from the radiation beam.

6. Standing away from the radiation beam, expose the source by manually raising the source rod. Note and record the survey meter reading, return the source to the stored position. The actual intensity is 800 mr/hr. If the reading is within $\pm 10\%$ of the actual intensity, continue checking the instrument. If the instrument reading is not within $\pm 10\%$ of the actual intensity, the instrument must be adjusted and recalibrated.
- CAUTION:** Do not enter the area of the radiation beam while the source is exposed.
7. Place the 0.25 attenuator in the beam. Repeat step 6; the actual intensity is 200 mr/hr.
 8. Remove the 0.25 attenuator from the beam and place a 0.10 attenuator in the beam. Repeat step 6; the actual intensity is 80 mr/hr.
 9. Place the 0.25 attenuator in the beam. Repeat step 6; the actual intensity is 20 mr/hr.
 10. Remove the 0.25 attenuator from the beam and place the other 0.10 attenuator in the beam. Repeat step 6; the actual intensity is 8 mr/hr.
 11. Place the 0.25 attenuator in the beam. Repeat step 6; the actual intensity is 2 mr/hr.

Leak Testing

The Tech/Ops Model 773 Meter Calibration Kit contains a $^{137}\text{Cesium}$ source which must be leak tested at intervals not to exceed six months. This may be accomplished using the Tech/Ops Model 518 leak test kit.

1. Place the Model 773 calibrator in a restricted area.
2. Remove the lock and rotate the handle from the top of the source rod. Remove the shipping cover.
3. Moisten the leak test swab with EDTA solution. Blot off the excess.
4. Wipe around the top of the source rod.
5. Standing away from the beam port, raise the source rod to the open position and

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wipe the exposed source rod thoroughly.

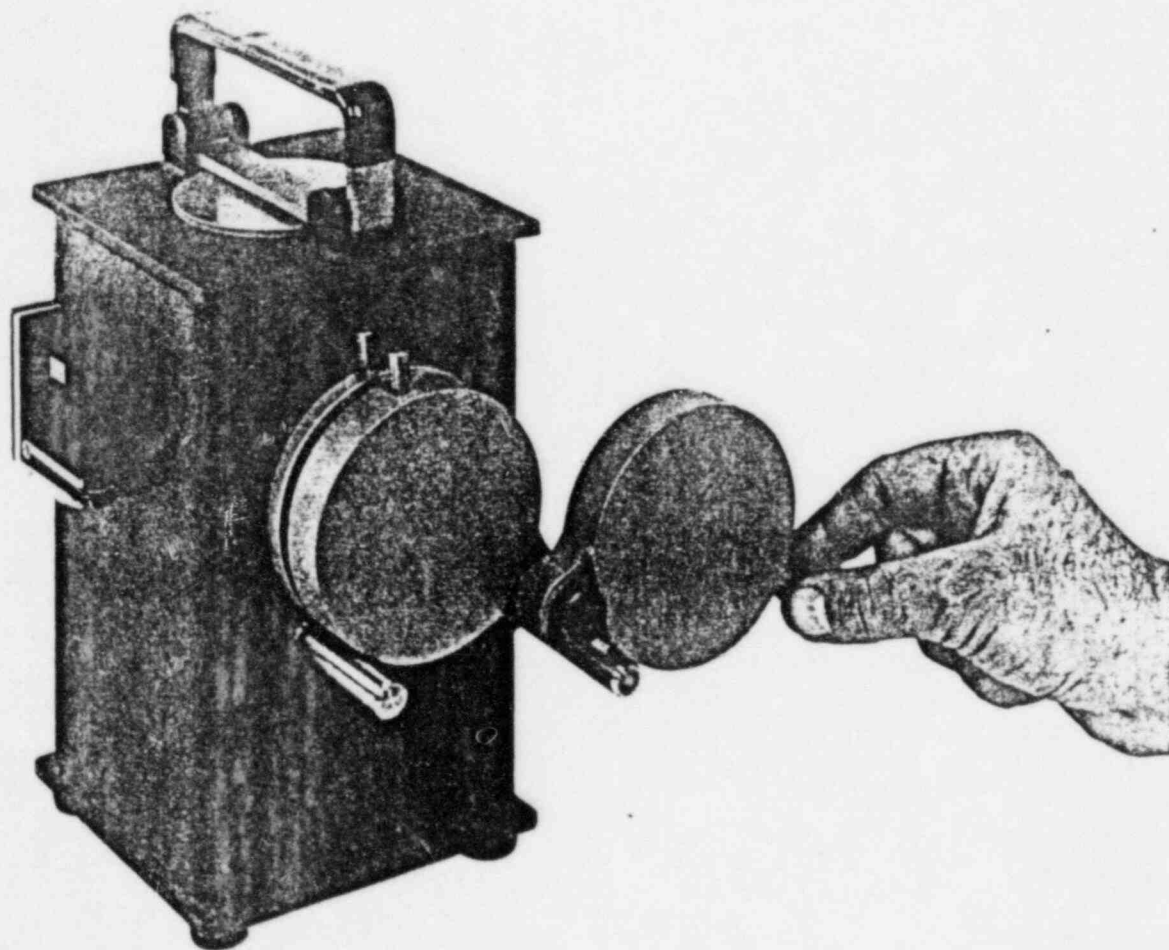
6. Place the leak test swab in the plastic envelope.
7. Set the survey meter on its most sensitive range and place the meter in a low background area. Move the swab, in its plastic envelope, to the meter, not the meter to the swab.
8. If the meter indication is less than 0.2 mr/hr above background, place the plastic envelope with the swab into the mailing box and mail to Technical Operations, Inc., Burlington, Massachusetts. BE SURE TO FILL OUT AND RETURN

THE IDENTIFICATION SHEET.

9. If the swab should show more than 0.2 mr/hr. DO NOT MAIL. Contact Technical Operations, Inc. for specific instructions.

Note:

The wipe test swab will be subjected to a precise radioassay when received by Tech/Ops and a leak test certificate will be mailed promptly. This certificate must be kept with your records as it is subject to N.R.C. inspection.



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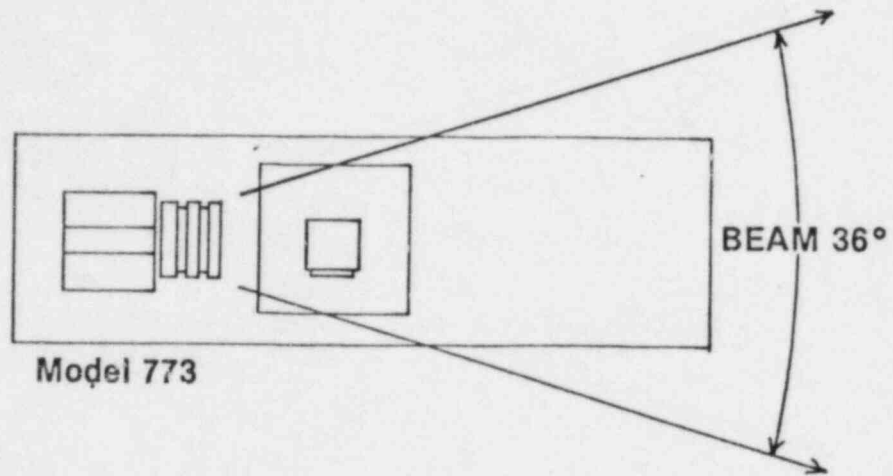


FIGURE 1

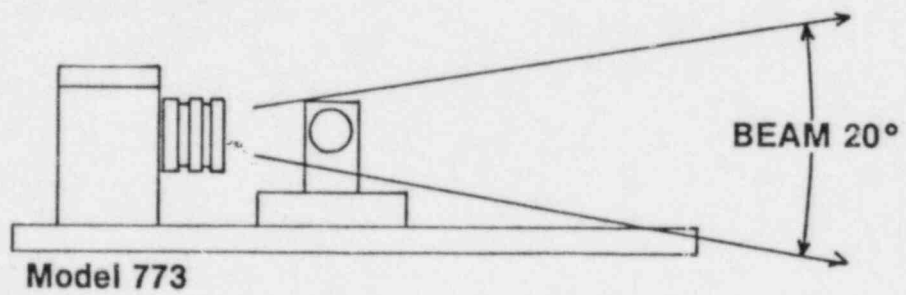
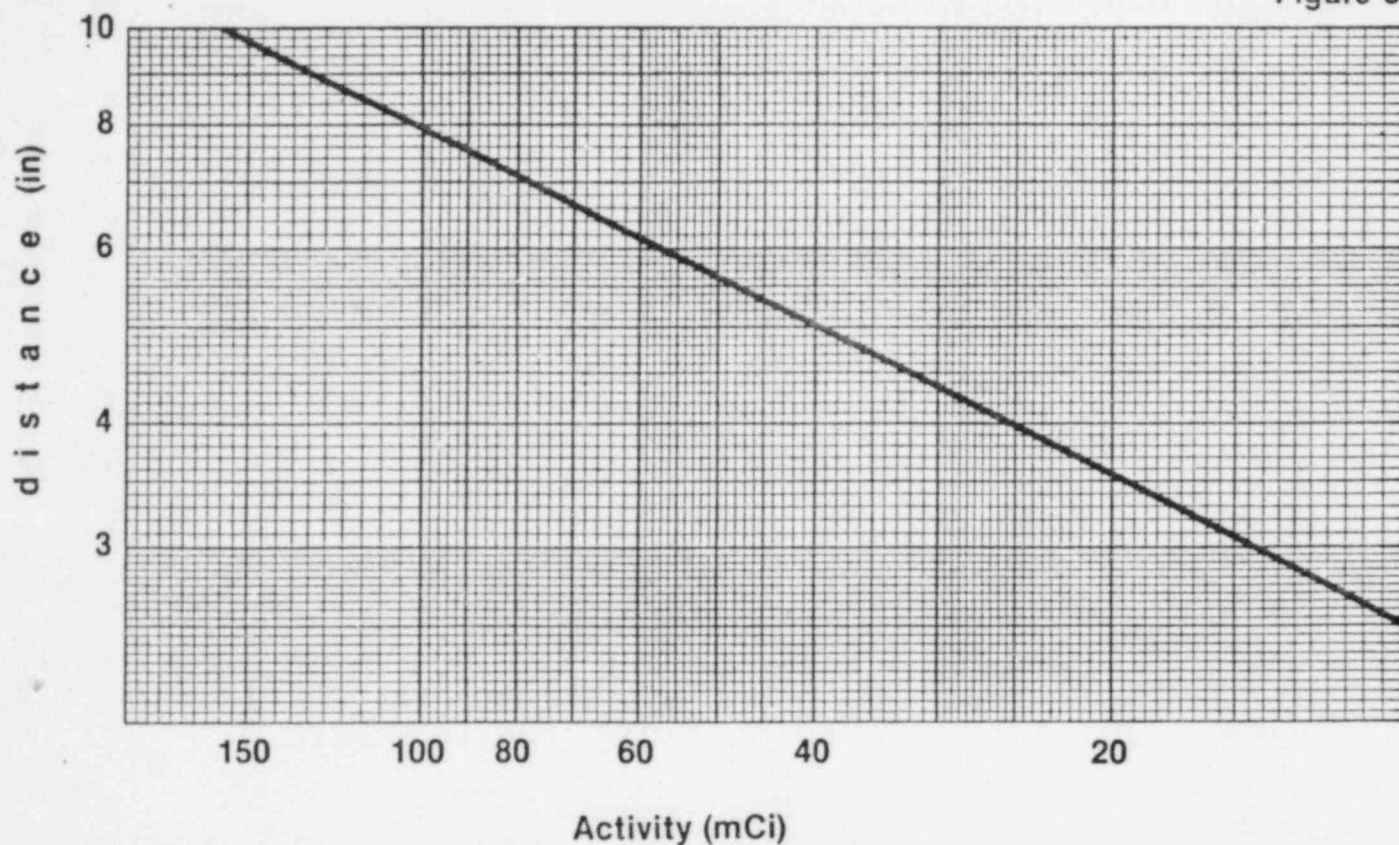


FIGURE 2

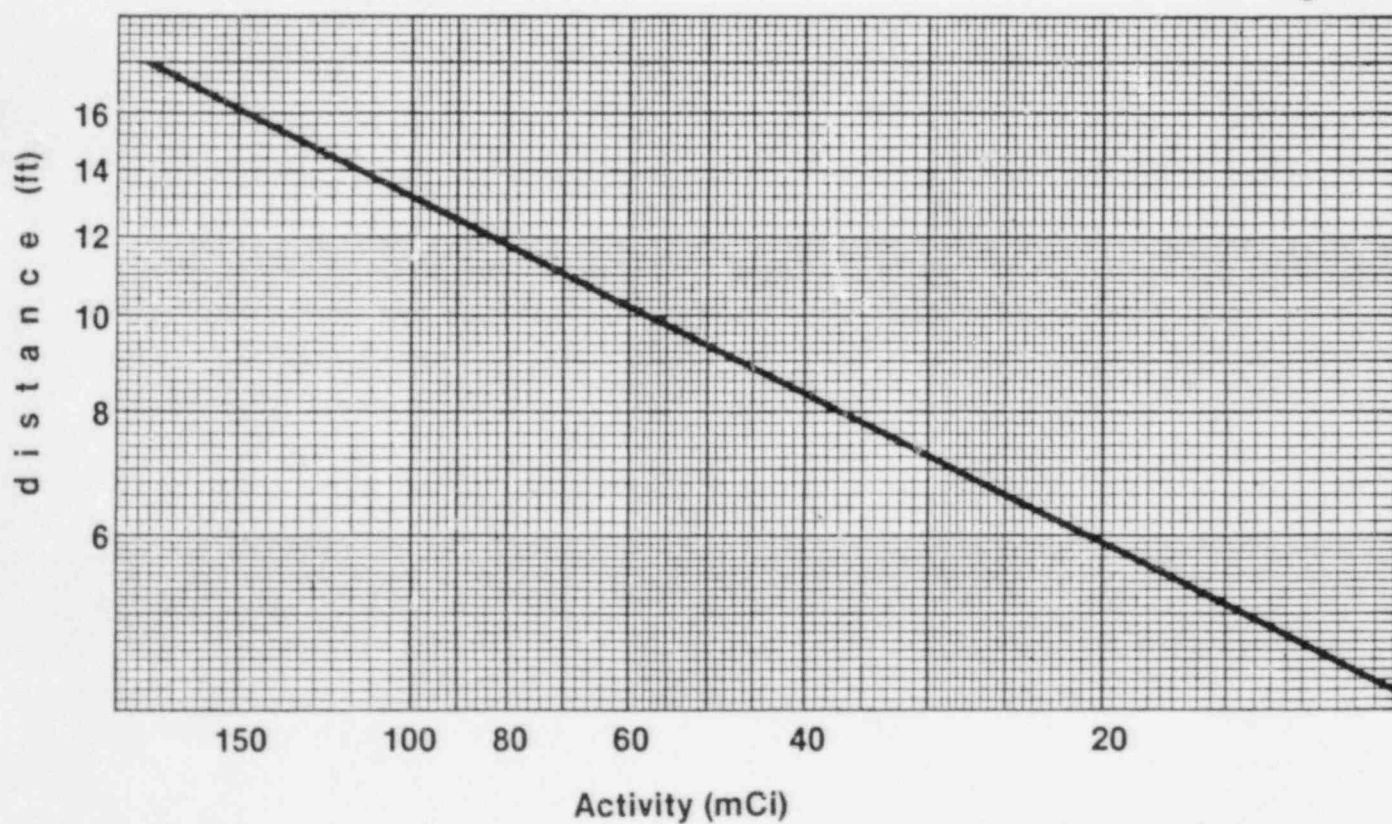
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Figure 3



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

Figure 4



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

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