TO: License Fee and Accounts Receivable Branch

FROM: Region IV - WCFO

SUBJECT: **VOIDED APPLICATION**

Applicant: Perforating Services, Inc.

Control Number: 565904

License No.: 49-19585-01

Docket No.: 030-18922

Date Voided: 8/12/96

Reason for Void:

This "amendment request" was to change this license to "storage only." A renewal was already being processed as Control No. 564740. As this action extends the license for 5 years for storage only, the "amendment" 565904 was voided and combined with the renewal, 564740. A review was conducted under this control.

Beth A. Prange 8/12/96
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFARB USE ONLY

Final Review of VOID completed:

___ Refund Authorized and processed

✓ No Refund Due

___ Fee Exempt or Fee Not Required

0/1
ML40

Comments: _____

Log completed ✓
Processed by: Kim

210010

BETWEEN:
LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03110
STATUS CODE: 2
FEE CATEGORY: 5A
EXP. DATE: 19930630
FEE COMMENTS:
DECOM FIN ASSUR REQD:

1995 NOV 22 AM 9:37

RECEIVED
FEB 26 1996
REGION IV

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: PEREORATING SERV.
RECEIVED DATE: 951120
DOCKET NO.: 3018922
CONTROL NO.: 465904
LICENSE NO.: 49-19585-01
ACTION TYPE: AMENDMENT

2. FEE ATTACHED
AMOUNT:
CHECK NO.: 1/

3. COMMENTS

SIGNED Billie Gruszynski
DATE 11/20/95

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED / /)

1. FEE CATEGORY AND AMOUNT: 5A 3P Storage Only

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT /
RENEWAL
LICENSE

3. OTHER

SIGNED Rita Messer
DATE 2/21/96

for Storage only

Log Nov 4 IV
Remitter
Check No. 9687 $290
Amount
Fee Category 5A 3P
Type of Fee amd
Date Check Rec'd.
Date Completed 2/21/96
By: Kim

PERFORATING SERVICES, INC.

POST OFFICE BOX 912 • CASPER, WYOMING 82602

November 10, 1995

U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Dear Sir:

Perforating Services Inc. requests the Nuclear Regulatory Commission to place our material license into a possession-only status. We are permanently ceasing all services involving radioactive materials, but we have been unable to dispose of our Americium-241 Sealed Neutron Source.

In answer to questions 1-9 as found in NRC Information Notice 93-50: Extended Storage of Sealed Sources, we submit the following information:

1. We possess 1-5 Curie Americium-241 Sealed Neutron Source, Gammatron Model AN-HP.

2. Efforts to dispose of above radioactive source includes phone calls to several wireline companies as well as to national wireline association.

3. P.S.I. has permanently ceased licensed operations and will not use the source for any purpose pending disposition and license termination.

4. The storage facility remains the same as approved in our license.

5. David Franklin will be responsible for maintaining control of the stored source.

6. Our accountability to ensure the source remains in secure storage and will be guaranteed as it always has.

7. As a result of placing our source in storage, we plan to discontinue the following:

   A. Dosimetry Services
   B. Worker Training Programs
   C. Instrument Calibration Services
   D. Quarterly Inventories
   E. Internal Audits
   F. Maintenance of Utilization Logs

   We will continue maintenance and visual inspection of equipment and storage facilities.

8. P.S.I. will Leak Test the source at least every 3 years and immediately before transfer to an authorized recipient.

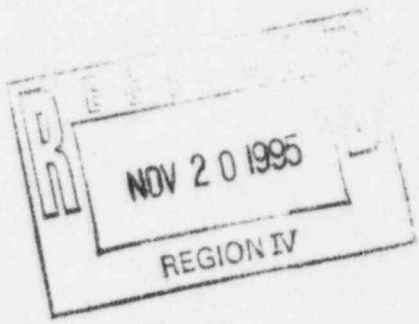
9. Does not apply to P.S.I.

Thank you for consideration of this request.

Sincerely,

Charles B. Franklin

Charles B. Franklin
President



NRC FORM 577 (10-94)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSE FEE REQUIREMENTS

LICENSE FEE AND DEBT COLLECTION BRANCH
DIVISION OF ACCOUNTING AND FINANCE
OFFICE OF THE CONTROLLER
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001
Attn: Rita Messler T9E10

Perforating Services, Inc.
Attn: Charles B. Franklin
President
P. O. Box 912
Casper, WY 82602

TYPE OF ACTION

- [ ] NEW LICENSE
- [ ] RENEWAL OF LICENSE
- [X] AMENDMENT TO LICENSE

REQUESTED DATE: 11/10/95

LICENSE NUMBER: 49-19585-01

CONTROL NUMBER: 465904

I. APPLICATION FEE DUE

Your request for a licensing action is subject to the fee(s) in the category(ies) noted below in accordance with Section 170.31 of the enclosed Federal Register notice. Payment of the fee is required prior to the issuance of the license, renewal, or amendment.

FEE CATEGORY	APPLICATION	RENEWAL	AMENDMENT
3P	$	$	$ 290.00
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$

FEE(s) DUE $
PAYMENT RECEIVED $ - 0 -
AMOUNT DUE $ 290.00

[X] Your request was received without the prescribed application fee.

[ ] We received your Check No. _____ in the amount of $_____. Payment of the additional fee noted above is required.

[ ] Your request will increase the scope of your license program. Therefore, your request is subject to the application fee(s) noted above. Refer to Section 170.31 and Footnote 1(d)(2).

[ ] Your license expired prior to the receipt of your application for renewal. Therefore, your request is subject to the application fee(s) noted above. Refer to Section 170.31 and Footnote 1(a).

MAKE PAYMENT OF THE FEE(S) TO THE U.S. NUCLEAR REGULATORY COMMISSION AND MAIL THE PAYMENT TO THE ADDRESS LISTED AT THE TOP OF THIS FORM. IF WE DO NOT RECEIVE A REPLY FROM YOU WITHIN 30 CALENDAR DAYS FROM THE DATE LISTED BELOW, WE SHALL ASSUME THAT YOU DO NOT WISH TO PURSUE YOUR APPLICATION AND WILL VOID THIS ACTION.

II. FEE NOT REQUIRED

[ ] Enclosed is Check No. _____ which accompanied your request. The fee is not required because:

- [ ] We received your Check No. _____ in payment of the fee.
- [ ] The Licensing staff has informed us that your request is to be considered as a continuation of your request dated _____, Control No. _____.
- [ ] Your request was combined, prior to review, with your _____ request, Control No. _____.

III. CHECK RETURNED

[ ] Enclosed is Check No. _____ which was returned to us by the bank for:

- [ ] INSUFFICIENT FUNDS
- [ ] ACCOUNT CLOSED
- [ ] OTHER

MAIL THE REPLACEMENT CHECK TO THE ADDRESS LISTED AT THE TOP OF THIS FORM AND REFERENCE THE ABOVE CONTROL NUMBER.

IV. LICENSE ISSUED WITHOUT THE REQUIRED FEE

[ ] License No. _____, Amendment No. ____, issued on _____ was issued without the required fee being collected. The fee required is noted in Section I of this form.

[ ] The scope of your licensed program was increased. Therefore, your request is subject to the application fee(s) noted in Section 1 of this form. Refer to Section 170.31 and Footnote 1(d)(2).

[ ] Because of the urgency of your request, the license was issued without remittance of the prescribed fee noted in Section 1 of this form.

SIGNATURE -- LICENSE FEE ANALYST	LFDCB	LFDCB
Rita Messler	Rita 11/22/95	/ /

DISTRIBUTION
DC/DAF/RF
LFDCB R/F (2)
Region IV
Pending Fee File

DATE: 11/22/95

NRC Form 374
(3-83)

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 3

ORC

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Perforating Services, Inc.	In accordance with letter dated November 10, 1995 3. License number 49-19585-01 is amended in its entirety to read as follows:
2. P.O. Box 912 Casper, Wyoming 82602	4. Expiration date August 31, 2001
	5. Docket or Reference No. 030-18922

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Americium-241	A. Sealed neutron sources (Gammatron Model AN-HP)	A. Not to exceed 5 curies

9. Authorized use

A. For storage only.

CONDITIONS

10. Licensed material may be stored only at the licensee's facilities located at 303 Industrial Park Drive, Gillette, Wyoming.

11. The licensee shall not vacate or release the storage location whose address is identified in Condition 10 for unrestricted use, without prior NRC approval. Reports of residual levels of facility contamination or other information concerning facility status may be required.

12. Licensed material shall be stored by David C. Franklin.

MLD

13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.

B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.

C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.

D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

E. Sealed sources need not be leak tested if:

(i) they contain only hydrogen-3; or

(ii) they contain only a radioactive gas; or

(iii) the half-life of the isotope is 30 days or less; or

(iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or

(v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

F. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately from service

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number 49-19585-01

Docket or Reference Number 030-18922

Amendment No. 3

13. (Continued)

and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, ATTN: Director, Division of Nuclear Materials Safety. The report shall specify the source involved, the test results, and corrective action taken.

G. The licensee is authorized to collect leak test samples for analysis by Isotech Laboratories. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.

14. The licensee shall maintain records of information important to safe and effective decommissioning at 303 Industrial Park Drive, Gillette, Wyoming, per the provision of 10 CFR 30.35(g) until this license is terminated by the Commission.

15. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Application dated February 12, 1988
B. Radiation Safety Manual received May 31, 1988
C. Letter dated November 10, 1995
D. Letter dated June 7, 1996
E. Letter dated August 3, 1996

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date AUG 12 1996

By Beth A. Prange
Materials Branch
Region IV, WCFO
Walnut Creek, California 94596

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03110
STATUS CODE: 2
FEE CATEGORY: 5A
EXP. DATE: 19930630
FEE COMMENTS: _____
DECOM FIN ASSUR REQD: _

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: PERFORATING SERV.
RECEIVED DATE: 930528
DOCKET NO: 3018922
CONTROL NO.: 464740
LICENSE NO.: 49-19585-01
ACTION TYPE: RENEWAL

RECEIVED
JUN 21 1993

2. FEE ATTACHED
AMOUNT: $2100.00
CHECK NO.: 3650

3. COMMENTS

SIGNED Jacqueline D Banks
DATE 6-4-93

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /)

1. FEE CATEGORY AND AMOUNT: 5A $2,100

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT _____
RENEWAL ✓
LICENSE _____

3. OTHER _____

SIGNED AC
DATE 6-14-93

NRC

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV

Walnut Creek Field Office
1450 Maria Lane
Walnut Creek, California 94596-5368

AUG 12 1996

Perforating Services, Inc.
ATTN: Charles B. Franklin
President
P.O. Box 912
Casper, Wyoming 82602

SUBJECT: LICENSE RENEWAL

Please find enclosed License No. 49-19585-01. You should review this license carefully and be sure that you understand all conditions. If you have any questions, you may contact the reviewer who signed your license at (510) 975-0250.

NRC expects licensees to conduct their programs with meticulous attention to detail and a high standard of compliance. Because of the serious consequences to employees and the public which can result from failure to comply with NRC requirements, you must conduct your program involving radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.

2. Possess radioactive material only in the quantity and form indicated in your license.

3. Use radioactive material only for the purpose(s) indicated in your license.

4. Notify NRC in writing of any change in mailing address (no fee required if the location of radioactive material remains the same).

5. Request and obtain written NRC consent before transferring your license or any right thereunder, either voluntarily or involuntarily, directly or indirectly, through transfer of control of your license to any person or entity. A transfer of control of your license includes not only a total change of ownership, but also a change in the controlling interest in your company whether it is a corporation, partnership, or other entity. In addition, appropriate license amendments must be requested and obtained for any other planned changes in your facility or program that are contrary to your license or contrary to representations made in your license application, as well as supplemental correspondence thereto, which are incorporated into your license. A license fee may be charged for the amendments if you are not in a fee-exempt category.

6. Maintain in a single document decommissioning records that have been certified for completeness and accuracy listing all the following items applicable to the license:

   - Onsite areas designated or formerly designated as restricted areas as defined in 10 CFR 20.3(a)(14) or 20.1003.

   - Onsite areas, other than restricted areas, where radioactive materials in quantities greater than amounts listed in Appendix C to 10 CFR 20.1001-20.2401 have been used, possessed, or stored.

   - Onsite areas, other than restricted areas, where spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site have occurred that required reporting pursuant to 10 CFR 30.50(b)(1) or (b)(4), including areas where subsequent cleanup procedures have removed the contamination.

   - Specific locations and radionuclide contents of previous and current burial areas within the site, excluding radioactive material with half-lives of 10 days or less, depleted uranium used only for shielding or as penetrators in unused munitions, or sealed sources authorized for use at temporary job sites.

   - Location and description of all contaminated equipment involved in licensed operations that is to remain onsite after license termination.

7. Submit a complete renewal application with proper fee, or termination request at least 30 days before the expiration date on your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of radioactive material after your license expires is a violation of NRC regulations.

8. Request termination of your license if you plan to permanently discontinue activities involving radioactive material.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation; imposition of a civil penalty; or an order suspending, modifying, or revoking your license as specified in the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), 60 FR 34381, June 30, 1995.

Thank you for your cooperation.

Sincerely,

Beth A. Prange

Beth A. Prange
Sr. Health Physicist (Licensing)
Materials Branch

Docket: 030-18922
License: 49-19585-01
Control: 564740

Enclosures: As stated

bcc:

Docket File
WCFO Inspection File
LFDCB, T-9 E10
State of WY (License Only)

DOCUMENT NAME: G:\beth\564740

To receive copy of document, indicate in box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

RIV:MB	N	C:MB							
BPrange BAP		FWenslawski							
08/12/96		08/ /96		08/ /96		08/ /96		08/ /96	

OFFICIAL RECORD COPY

PERFORATING SERVICES, INC.

POST OFFICE BOX 912 • CASPER, WYOMING 82602

August 3, l996

U.S. Nuclear Regulatory Commission
1450 Maria Lane Suite 210
Walnut Creek, CA 94596-5368

Attention: B. Prange

Dear Ms Prange:

Our Leak Tests will be performed by:
Isotech Laboratories
P. O. Box 8608
Midland, TX 99708

We sent them a swab test on 7-22-96.

We are requesting an alternate licensing schedule to show complete decommissioning of our license.

The Source will be disposed of when such a facility is provided.

Sincerely,

Charles B. Franklin
President

564740
~~565904~~

U.S. NUCLEAR REGULATORY COMMISSION
REGION V

TELEPHONE OR VERBAL CONVERSATION RECORD MS-15

DATE ~~00/00/00~~ 7/5/96

TIME 00:00 am/(pm)

[ ] INCOMING CALL [X] OUTGOING CALL [ ] VISIT

PERSON CALLING:	OFFICE/ADDRESS:	PHONE NUMBER:

PERSON CALLED:	OFFICE/ADDRESS:	PHONE NUMBER:
David Franklin	Perforating Services	(307)682-6719

CONVERSATION

SUBJECT - Storage - only states

SUMMARY -

1. Who will analyze leak tests? Isn't Gulf Nuclear out of business? David will check + get back to us in writing.

2. Request an alternate decommissioning schedule per 10 CFR 30.36. Explain that the source will be disposed when a waste disposal site is available.

- B. Prange

REFERRED TO:	[ ] ADVISE ME ON ACTION TAKEN
ACTION REQUESTED:	INITIALS:
	DATE:
ACTION TAKEN: Sent David Franklin a copy of 10CFR 30.36, via regular mail.	INITIALS: BAP
	DATE: 7/5/96.

NRC FORM 218 REV-0 8/93 [WP/hdc-RIV]

PERFORATING SERVICES, INC.

POST OFFICE BOX 912 • CASPER, WYOMING 82602

June 7, 1996

Nuclear Regulatory Commission
Beth Prange
Walnut Creek Field Office

Perforating Services, Inc. hereby makes a commitment to the N.R.C. to do the following:

1. Perform annual physical inventory of source.

2. Ensure the source remains in secure storage and is not used.

3. Amend license when necessary and ensure license conditions are followed.

4. Have leak test performed by:

   Gulf Nuclear Inc.
   202 Medical Center Blvd.
   Webster TX 77598
   713-332-3581

Charles B. Franklin

564740
~~565904~~

NRC FORM 366
(12 89)

Discussed with Mr. Franklin by telephone, this date.

TELECOPIER TRANSMITTAL

MS-15

3/14/96

TIME 10:05am

WARNING: Most facsimile machines produce copies on thermal paper. The image produced is highly unstable and will deteriorate significantly in a few years. Reproduce copies onto plain paper prior to filing as a record.

TO

NAME	TELEPHONE
David Franklin	(307)682-6719

NAME AND LOCATION OF COMPANY (If other than NRC)

Perforating Services, Inc.

TELECOPY NUMBER	VERIFICATION NUMBER
(307) 682-4396	

FROM

NAME	TELEPHONE	MAIL STOP
Beth Prange FAX: (510)975-0381	(510) 975-0250	RIV; Walnut Creek Field Office

TELECOPY DATA

NUMBER OF PAGES

THIS PAGE + 5 PAGES = 6 TOTAL

PRIORITY

- [ ] IMMEDIATE
- [ ] OTHER (Specify)

SPECIAL INSTRUCTIONS

1.) I need a commitment that you will perform an annual physical inventory of your source.
2.) I need a commitment that you will ensure that the source remains in secure storage and is not used.
3.) I need a commitment that you will amend the license when necessary and ensure that License Conditions are followed.
4.) I need to know the name, address + phone no. of the company who will conduct leak test analysis for you.

PROBLEMS

If any problems occur or if you do not receive all the pages, call:

TELEPHONE

DISPOSITION OF ORIGINAL

After telecopy has been sent, process the original as requested below. (If none are checked, the original will be discarded.)

- [ ] RETURN TO SENDER
- [ ] CALL AND SENDER WILL PICK UP
- [ ] DISCARD

PROCESSED BY (INITIALS)

VERIFIED BY (INITIALS)

PRINTED ON RECYCLED PAPER

NRC FORM 366 (12 89)

PERFORATING SERVICES, INC.

POST OFFICE BOX 912 • CASPER, WYOMING 82602

November 10, 1995

U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Dear Sir:

Perforating Services Inc. requests the Nuclear Regulatory Commission to place our material license into a possession-only status. We are permanently ceasing all services involving radioactive materials, but we have been unable to dispose of our Americium-241 Sealed Neutron Source.

In answer to questions 1-9 as found in NRC Information Notice 93-50: Extended Storage of Sealed Sources, we submit the following information:

1. We possess 1-5 Curie Americium-241 Sealed Neutron Source, Gammatron Model AN-HP.

2. Efforts to dispose of above radioactive source includes phone calls to several wireline companies as well as to national wireline association.

3. P.S.I. has permanently ceased licensed operations and will not use the source for any purpose pending disposition and license termination.

4. The storage facility remains the same as approved in our license.

5. David Franklin will be responsible for maintaining control of the stored source.

6. Our accountability to ensure the source remains in secure storage and will be guaranteed as it always has.

7. As a result of placing our source in storage, we plan to discontinue the following:

   A. Dosimetry Services
   B. Worker Training Programs
   C. Instrument Calibration Services
   D. Quarterly Inventories
   E. Internal Audits
   F. Maintenance of Utilization Logs

   We will continue maintenance and visual inspection of equipment and storage facilities.

8. P.S.I. will Leak Test the source at least every 3 years and immediately before transfer to an authorized recipient.

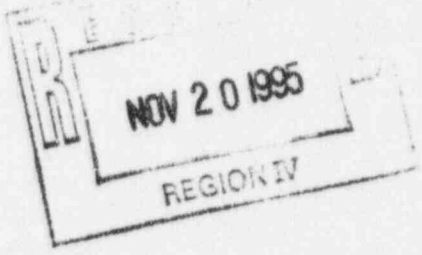
9. Does not apply to P.S.I.

Thank you for consideration of this request.

Sincerely,

Charles B. Franklin

Charles B. Franklin
President



Beth P. E.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

July 8, 1993

NRC INFORMATION NOTICE 93-50: EXTENDED STORAGE OF SEALED SOURCES

Addressees

All licensees authorized to possess sealed sources.

Purpose

The U.S. Nuclear Regulatory Commission is issuing this information notice to inform addressees of what information NRC considers necessary for placing a license into a possession-only status, if extended storage of sealed sources is necessary. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to provide all necessary information when requesting possession-only licenses. However, suggestions contained in this information notice are not new NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

A number of licensees who possess sealed sources have gone out of business or allowed their licenses to expire for various reasons. These licensees are finding it difficult, and sometimes impossible, to dispose of their radioactive sources. There have been several incidents where licensees having financial difficulty have abandoned their sources in violation of NRC regulations.

Disposal is especially difficult for greater-than-Class-C (GTCC) sealed sources. The requirements for classifying waste for near-surface disposal are provided in 10 CFR 61.55. This regulation states that GTCC waste is generally not acceptable for near-surface disposal and must be disposed of in a geologic repository, pursuant to Part 60, unless another disposal method is approved by NRC. Many sealed source users have discovered that they have no place to ship their GTCC sources for disposal, because no geologic repository is currently available.

The Low-Level Radioactive Waste Policy Amendments Act of 1985 designates the Federal Government as responsible for disposal of GTCC wastes. Congress has designated the Department of Energy (DOE) as the responsible agency for disposal of GTCC waste. NRC has been working with DOE to establish an interim storage facility for GTCC waste, until a geologic repository is available. DOE estimates that a storage facility may be available by the end of 1997. However, further delays in meeting this schedule may occur.

Discussion

If a licensee with sealed sources wishes to terminate its license, but cannot find any way to dispose of its sources, the licensee can request an amendment to restrict its license to possession-only, incident to license termination. Under current annual fee regulations, this will exempt the licensee from the requirement to pay an annual fee under 10 CFR Part 171 for the fiscal year following issuance of the license amendment authorizing possession only, and each year thereafter. (Each fiscal year begins on October 1.) The licensee will continue to be subject to licensing and inspection fees under 10 CFR Part 170. The inspection frequency for possession-only licenses is once every 3 years under current NRC inspection procedures.

The annual fee waiver is intended for licensees who have permanently ceased licensed operations. The annual fee will not be waived for licensees who wish to put their licenses, certificates, approvals, or registrations in an inactive status, on a temporary basis, with the intent of reactivating them as needed. The following information is needed to process requests for possession-only licenses:

1. Identification of each sealed source to be placed in storage, including the manufacturer's name, model number, serial number, isotope, and activity.

2. A detailed description of efforts made to dispose of the sources, including telephone calls, letters, facsimiles, personal contacts, etc.

3. A statement that the licensee has permanently ceased licensed operations and a commitment not to use the sources for any purpose pending disposition and license termination.

4. A physical description of the facilities where the sealed sources will be stored, if it is different from storage facilities already approved in the license. Identify any facility changes that are planned after the sources are placed in storage and provisions to maintain exposure to radiation as low as reasonably achievable (ALARA).

5. Identification of the individual who will be responsible for maintaining control of the stored sources. Provide a resume of training and experience, if this information has not already been provided.

6. A description of the accountability program to be implemented by the licensee to ensure that its sources remain in secure storage and are not used. The program should provide reasonable assurance that the licensee can maintain security and account for the sources (inventory at least annually).

7. A description of planned changes to the licensee's radiation safety program as a result of placing the sources in storage. These changes may include, but are not limited to, the following:

   a. dosimetry services
   b. worker training programs
   c. instrument calibration services
   d. quarterly inventories
   e. internal audits
   f. maintenance and visual inspection of equipment and storage facilities
   g. maintenance of utilization logs

8. A commitment to leak-test the sources at least once every 3 years and immediately before transfer to an authorized recipient.

9. A commitment to maintain the license in an active state. (Note that amendment, renewal, and inspection fees will continue to apply.)

When a storage/disposal facility becomes available, it is expected that licensees with possession-only licenses will transfer their sealed sources and request license termination.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the contacts listed below or the appropriate regional office.

Carl J. Paperiello

Carl J. Paperiello, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Technical contacts: Jack Whitten, RIV
(817) 860-8197

Kevin Ramsey, NMSS
(301) 504-2534

Fee contact: Doug Weiss, OC
(301) 492-7225

Attachments:
1. List of Recently Issued NMSS Information Notices
2. List of Recently Issued NRC Information Notices

PERFORATING SERVICES, INC.

POST OFFICE BOX 912 • CASPER, WYOMING 82602

November 10, 1995

U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Dear Sir:

Perforating Services Inc. requests the Nuclear Regulatory Commission to place our material license into a possession-only status. We are permanently ceasing all services involving radioactive materials, but we have been unable to dispose of our Americium-241 Sealed Neutron Source.

In answer to questions 1-9 as found in NRC Information Notice 93-50: Extended Storage of Sealed Sources, we submit the following information:

1. We possess 1-5 Curie Americium-241 Sealed Neutron Source, Gammatron Model AN-HP.

2. Efforts to dispose of above radioactive source includes phone calls to several wireline companies as well as to national wireline association.

3. P.S.I. has permanently ceased licensed operations and will not use the source for any purpose pending disposition and license termination.

4. The storage facility remains the same as approved in our license.

5. David Franklin will be responsible for maintaining control of the stored source.

6. Our accountability to ensure the source remains in secure storage and will be guaranteed as it always has.

7. As a result of placing our source in storage, we plan to discontinue the following:

   A. Dosimetry Services
   B. Worker Training Programs
   C. Instrument Calibration Services
   D. Quarterly Inventories
   E. Internal Audits
   F. Maintenance of Utilization Logs

   We will continue maintenance and visual inspection of equipment and storage facilities.

8. P.S.I. will Leak Test the source at least every 3 years and immediately before transfer to an authorized recipient.

9. Does not apply to P.S.I.

Thank you for consideration of this request.

Sincerely,

Charles B. Franklin

Charles B. Franklin
President

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV

Walnut Creek Field Office
1450 Maria Lane
Walnut Creek, California 94596-5368

FILE COPY

OCT 2 6 1995

Perforating Services, Inc.
ATTN: David Franklin
Radiation Protection Officer
P.O. Box 912
Casper, WY 82602

This is in reference to your request dated May 12, 1993, for renewal of your byproduct material license. In order to complete our review, we need the following additional information:

1. Several sections of your renewal application refer to the old 10 CFR Part 20 of NRC regulations. Please review the new Part 20 (enclosed) and amend the references in your application accordingly. Some radiation dose limits have also changed as a result of the new Part 20 and also should be corrected.

2. In Item 8, Training Requirements, you requested an exemption from 10 CFR 39.13(b). As in your previous license, we continue to consider David Franklin and Clint Copping as Well Logging Supervisors. Since you have not listing anyone as a Logging Assistant, we will continue to not list anyone in this category on your license. Therefore, no exemption is necessary since a training program for Logging Assistants is irrelevant. However, should you wish to designate one or more employees as Logging Assistants in the future, you will have to submit your training program and receive a license amendment.

3. In Item 8, Training Requirements, you need to add the requirement for on-the-job training in accordance with 10 CFR 39.61.

4. In the answer key for the Logging Supervisors Exam has an incorrect answer for question 32. Please correct the .4 MR/HR answer. Also there is no question to go with the 200 MR/HR answer.

5. Item 9, Facilities and Equipment

   10 CFR 39.63(b) requires the development of procedures that cover the use of remote handling tools. The use of "heavy rubber gloves" in place of remote handling tools is not acceptable. However, you may request an exemption from this requirement if you can demonstrate that extremity radiation exposure is equal to or less than the dose received using remote handling equipment. You will also need to demonstrate that the liquid I-131 container can be handled safely to avoid spills using the heavy gloves.

6. Item 10.1, Agreement with well owners or operator

   Please provide a copy of this "agreement". It was not included with your renewal application.

7. Item 10.2, Personnel Monitoring Equipment

   Please include in this item your procedures for turning in employees badges for processing, steps to take if a badge is lost or damaged and where employees should store badges when not in use.

8. Item 10.4.2, Calibration

   Please provide a copy of a "sample calibration report". It was not included with your renewal application. Also, please confirm that your survey instruments will be calibrated at intervals not to exceed 6 months as required by 10 CFR 39.33.

9. The remaining questions pertain to your Operating and Emergency Procedures Manual as follows:

   a. Inspection and Maintenance of Equipment

      The fifth sentence states that the report of the inspection " ... should include the date, name of the inspector, the equipment involved, defects noted, and repairs that were made. "Should" needs to be changed to "shall" since these record entries are required by 10 CFR 39.43.

   b. Appendix B, Procedures for Storing Sealed Sources of Radioactive Materials

      In accordance with 10 CFR 39.63(e), please add instructions to personnel to not permit licensed material to be left unattended in such a manner that unauthorized persons could have access to it.

   c. Do you plan to use sealed logging sources in wells without surface casing to protect fresh water aquifers? Is so, please list the procedures to be followed to minimize the chances of the source becoming lodged in the well. Examples of acceptable procedures might include:

      - Obtaining specific knowledge of the borehole conditions, perhaps from the drilling team or company.

      - First running a caliper log to show the hole is open or to find problem areas.

      - First running a tool without a radioactive source to show it can be freely removed.

      - Placing a temporary casing in sections of the hole giving problems.

d. Leak Test Procedures

This procedure describes the use of a commercial leak test kit. Please provide a copy of the wipe test procedure. No procedure was included with your renewal application.

e. Procedure for Lost Source Downhole

Item (4) should be amended to read "during the critical fishing operations the mud being circulated shall be monitored using a gamma radiation detection instrument. This is required by 10 CFR 39.69.

f. Operating Procedures for Handling Radioactive Tracers

Items in this procedure dealing with use of protective clothing and gloves, controlling exposure times and radiation monitoring are prefaced with the word "should". These practices are required and employees need to be informed that they must or shall be done.

g. Transporting Radioactive Materials

This section needs to include an example of the required shipping paper and instructions to employees on how to fill it out in accordance with U.S. Department of Transportation Regulations.

h. Appendix D, Procedures For Lost Source Downhole - Summary

Please add instructions to employees concerning actions they are to take if a logging sealed source rupture occurs. These instructions are required by 10 CFR 39.63(a) and 39.69(a).

We will continue the review of your license renewal request upon receipt of this information. Please submit your response to this letter within 30 days from the date of this letter, reply in duplicate and refer to Mail Control No. 564740.

Sincerely,

James L. Montgomery

James L. Montgomery
Senior Health Physicist
Materials Branch

Docket: 030-018922
License: 49-19585-01
Control: 564740

Enclosure: As stated

bcc:

Docket File
WCFO Inspection File
LFDCB, T-9 E10

DOCUMENT NAME: G:\564740.DEF

To receive copy of document, indicate in box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

RIV:MB									
JLMontgomery JLM									
10/26/95									

OFFICIAL RECORD COPY

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

JUN 21 1993

Perforating Services, Inc.
ATTN: David Franklin
P. O.Box 912
Casper, Wyoming 82602

Docket No. 030-18922
License No. 49-19585-01
Control No. 464740

Gentlemen:

This is to acknowledge receipt of your application for renewal of the byproduct material license identified above. Your application is deemed timely filed and, accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Original Signed By
Billie Gruszynski

Billie Gruszynski (Ms.)
Nuclear Materials Licensing Section

JUN 21 1993

RIV:NMLS BG
BGruszynski
6/21/93

NRC FORM 313
(1-84)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

RECEIVED
MAY 28 1993

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [X] C. RENEWAL OF LICENSE NUMBER 49-19585-01

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Perforating Services Inc.
P.O. Box 912
Casper, Wy. 82602

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

303 Industrial Park Drive
Gillette, Wyoming

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

David Franklin

TELEPHONE NUMBER: 307-682-6719

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*

FEE CATEGORY

AMOUNT ENCLOSED $ Paid

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE—CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
David Franklin	David Franklin	R.P.O.	2-12-88

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

- [X] <$250K
- [ ] $250K–500K
- [ ] $500K–750K
- [ ] $750K–1M
- [ ] $1M–3.5M
- [ ] $3.5M–7M
- [ ] $7M–10M
- [ ] >$10M

b. NUMBER OF EMPLOYEES *(Total for entire facility excluding outside contractors)*: 3

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION *(dollar and/or staff hours)* ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? *(NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency in confidence)*

- [X] YES
- [ ] NO

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
AMOUNT RECEIVED	CHECK NUMBER			DATE 4 6 4 7 4 0

PRIVACY ACT STATEMENT ON THE REVERSE

PERFORATING SERVICES INC.

Operating and Emergency

Procedures

Personnel to be notified in the event of an emergency:

RPO----------David Franklin 307-682-6719 Office

307-686-3747 Home

President----------Charles Franklin 307-682-6719 Office

307-237-8922 Home

APPENDIX A

1. Radiation Program Management and Responsibility
   a. Company Organization Chart
2. Radiation Safety Officer
3. Personnel Monitoring Procedures
4. Storing and Securing Radioactive Materials
5. Posting Requirements
6. Records Management
7. Procedures for Transporting Radioactive Materials

APPENDIX A

1. Radiation Program Management and Responsibility

   a. The Radiation Protection Officer is to be designated overall manager for the radiation program.

   b. The duties of the Radiation Protection Officer include the delegation of authority to persons responsible for carrying out the duties such as that of Radiation Safety Officer, overall responsibility for records, surveys, the forming of committees where necessary and in general the administrative procedures for the entire radiation program. The Radiation Protection Officer is David Carl Franklin.

2. The Radiation Safety Officer is responsible to the Radiation Protection Officer and in general is to conduct or cause to be conducted the programs and responsibility delegated by the Radiation Protection Officer. These duties might include:

   a. Site surveys

   b. Records, personnel monitoring records and compilation

   c. Vehicle survey records

   d. Training and qualifying personnel

   e. Conducts periodic safety checks to assure the radiation protection program.

   The Radiation Safety Officer for PERFORATING SERVICES, INC.,

   _____ is David Carl Franklin.

3. Personnel Monitoring Procedures

   All personnel directly related to activity involving radioactive materials will wear a film badge or a extremity TLD badge er. Film badge records will be quarterly and monitoring will be at least on a quarterly basis.

   It is clearly understood that maximum acceptable dose levels are not to exceed 1.25 Rem per calendar quarter or no more than 5.0 Rem per calendar year.

   It is also clearly understood that in the event these doses are greater than those listed above that proper notification will be posted with the licensing authority. Also reports of dosages will be maintained on at least a quarterly basis.

4. Storing and Securing Radioactive Materials

   Upon receipt of the radioactive materials the receiving records will be placed in a properly marked file. The materials will be placed in a secure area that is properly marked with appropriate signs around the perimeter. This area will be either a room, a storage area or a storage bunker but will in any case contain a door or lock type top. Materials when not in use will remain in the storage area properly locked and secured.

g. Surveys will be conducted by monitoring a well bore at the surface prior to use of any radioactive material and remonitoring the well bore upon completion of the work. These numbers will be recorded. A survey meter or tool which is acceptable will be used for the monitoring process. Records of this survey performed on each job will be maintained in a file.
Note: A master file of "c" thru "g" is on file at the Gillette office.

7. Procedures for Transporting Radioactive Materials

a. Radioactive materials may be transported by company vehicle or private vehicle provided the vehicle is marked properly and the material transported is properly packaged and marked. An identification will be on each container transported and the vehicle will be placarded with the proper D.O.T. markings.

b. The vehicle transporting radioactive materials will be clearly placarded with a 6" x 28" safety yellow background with black letters sign that reads "Radioactive".

c. Packages transported will be packaged as received from the supplier. These packages generally bear a diamond shaped Yellow III label.

It is clearly understood that signs will be removed when vehicle does not transport radioactive materials.

Ordering and Receiving of Radioactive Materials

1. Any order of radioactive material must be authorized by the RPO for the company. This is to ensure that maximum amounts listed on the license are not exceeded.

2. Any delivery firm will be given a copy of our recieving procedures.

3. All deliveries of radioactive materials will be made to our office at 303 Industrial Park Drive, Gillette, Wyoming.

4. Notification of deliveries of radioactive material are to be directed to David Franklin -303-682-6719. He is also to be notified in the event of damaged packaging.

5. No package with radioactive labeling is exempt from these procedures.

6. Protective gloves will be worn when opening R/A packages.

7. Upon receipt, all packages should be visually inspected for signs of damage. If damage is noted, contact RPO, contact supplier of material, survey package with meter, open packaging carefully while checking for contamination.

8. The paking slip should be compared with package contents to ensure that they are the same and that they match the order.

9. Survey the package at 1 meter and record the reading. Survey the package surface and record the reading. If the readings are higher than allowed by DOT regulations contact NRC.

10. Check the integrity of final container. Check for broken seals or vials, loss of fluid, and discoloration of packing material.

11. If contamination is suspected, wipe the external surface of the final container and survey the wipe sample in a low background area. If contamination is shown, contact RPO and prepare to decontaminate as per written procedures.

12. Survey packing material, if no contamination is shown discard as trash, if contamination is noted treat as radioactive waste.

13. All survey records are to be kept for 3 years. Records of receipt of licensed material are to be kept in accordance with 30.51 of 10 CFR Part 30.

Inspection and Maintenance of Equipment

Prior to the use of any equipment related to the use of licensed material, a visual inspection will be made to ensure that there are no defects. Included in the inspection will be handling tools-source holders-survey meters-logging tools-tracer ejecters-transport containers. Labeling required by Sections 39.49 and 39.31 of 10 CFR Part 39 must also be attached and ledgible. If any defects are noted, the item must be removed from service until defect is corrected. A report of the inspection is to be filled out and should include the date, name of the inspector, the equipment involved, defects noted, and repairs that were made. The RPO must be made aware of any defects noted. The NRC must also be notified as per 10 CFR Part 21.

Semiannual Maintenance Program

Every 6 months the RPO will conduct a maintenance inspection of all licensed material related equipment. The inpection will include remote handling tools, source holders, logging tools, tracer injectors, and survey meters. Any item found to be defective will be removed from service until repairs have been made. A report of the inspection will be made and will include the date, defects noted, maintenance and inspection operations performed, and repairs made.

APPENDIX B

I. Procedures for Storage
   a. Storage
   b. Transport
II. Procedures for Use of Radioactive Sources
III. Radiation Surveys
IV. Leak Test Procedures
V. Procedures for Lost Source Downhole
VI. Emergency Procedures
VII. Safety Curve for AmBe Sources

APPENDIX B

I. Procedures for Storing Sealed Sources of Radioactive Materials

a. Storage

Radioactive sources must be locked in their shield and kept in a locked storage, truck compartment, cabinet, pit or chained and locked to an integral part of the truck when not in use.

Storage facilities must be designed or positioned so that no person in an uncontrolled area can receive more than 2 mR in any one hour or more than 100 mR in any seven consecutive days.

(1) Storage Pits (Downhole)

(a) Minimum of two feet of earth, concrete or fill separate adjacent pits.
(b) Pits to be a minimum of four feet deep.
(c) Lids to be screwed on or recessed in, designed to exclude water and equipped with a locking device.

(2) Surface Storage

(a) Steel bunker with locking device
(b) Sources are placed inside steel box in their transport shields
(c) Maximum reading on contact, 2 mR or less. If higher reading, a fenced perimeter will be established at the 2 mR level.

(3) Posting

All storage areas must be posted "Caution-Radioactive Materials". On surface storage bunker, the posting "Caution Radiation Area" must be on four sides and on controlling fences for the area.

b. All radioactive material sources used will be stored in their shielded transport containers. They will be removed from surface storage vault and placed on vehicles, either in lock type transport cases or will

be chain locked to an integral part of the vehicle. Vehicle will then be placarded with D.O.T. specification "RADIOACTIVE" Signs on all four sides.

II. Procedure for Use of Radioactive Sources

Company personnel directly in charge of logging operations utilizing radioactive sources are responsible for the health protection of all personnel associated with the sources and the general public whom may be associated at all times. The above personnel (company) must personally supervise all source handling operations, transportation, storage and shipping according to the following regulations.

(1) Company personnel who have been trained in handling sealed sources shall be the only ones who perform operations involving the sources. All customer personnel shall be required to be remote to these operations.

(2) Only the company approved handling tools will be used.

(3) All sources are to be transported in the approved and locked source shipping containers.

(4) Using the remote handling tools the source is removed from the shipping or transport container. The source is attached to the logging tool and placed inside of the well. When logging operation is finished the logger will return source to surface, the logging operator will remove tool from well, utilizing remote handling tool, the source will be removed from the tool and placed back into the storage container. The time-distance factors must be used effectively when working with radioactive sources to keep exposure to a minimum. When utilizing the remote handling tools a safe distance is provided but care and practice are needed to decrease the handling exposure time.

(5) Any sources that you are not familiar with, in handling and usage, contact the area engineer or the Radiation Safety Officer before using them in a logging job.

III. Radiation Surveys

(1) Pit source storage bunker-remove storage or transport container from bunker. With portable low-level survey meter, take reading at six inches from source.

Record on Job Log Sheet. Place source in vehicle in secure position. (Locked containment) Survey vehicle on all four sides. Record on Job Log Sheet.

Arrival at well site-using low level survey meter, monitor the area before commencing job. Record on sketch of area. After job is finished remonitor area to determine there is no contamination around well site. Record on Job Log Sheet. After arriving at storage site monitor vehicle to show free of contamination.

The following handling equipment must be present and used on well sites: Gloves, handling tools, protective clothing.

IV. Leak Test Procedures

Wipe tests on all sources must be preformed at intervals not exceeding six month.

Source will be wipe tested with Gulf Nuclear, Inc. Model LTK-1 Leak Test Kit. (Procedures enclosed)

Leak Test kits will be mailed to Gulf Nuclear, Inc. at Houston, Texas for counting.

Reports will be sent back to licensee with leak test certificate.

V. Procedure for Lost Source Downhole

(1) When a source is lost notify the well owner or his representative that a source is stuck in the well. As soon thereafter as possible hand him a drawing of the source and housing model. This will enable him to know before he starts the fishing operation the quantity, type of radioactive material and the mechanical construction of the capsule and tool involved.

Immediately notify the State Radiation Control Agency involved and the U.S. Nuclear Regulatory Commission that the source has been lost and keep them informed of the progress toward recovery of the source.

(2) Client-to be notified.

(3) Dosimeters will be furnished to all rig personnel and company personnel. The owner will be advised

that these are for their protection and intended primarily for a record of trivial or no exposures to his employees.

(4) During the critical fishing operations the mud being circulated should be monitored using gamma ray equipment.

(5) You have only time and distance factors available to reduce the radiation field and personnel exposure while the source is being fished out. Where practical everyone except the driller and enough personnel to cover the hole should remain in the area. All handling of the drilling rig equipment should be handled by the customer and actual handling of the source shall be done by the licensee.

VI. Emergency Procedures

Emergencies vary greatly in their respective hazards. These are sometimes in the form of spills, fires, explosions or vehicle wrecks which consequently result in the spread of radioactive material contamination. The National Bureau of Standards Handbook Number 48, Emergency Guides, are used as a guide for the procedures. These procedures are general and any specific emergency would certainly involve additional procedures not covered in the outline.

(1) Vehicle Wreck

In the event of an accident while transporting radioactive materials, efforts should be made to minimize the exposure of any persons. This would include roping off the area, notification of the investigating officer, and Radiation Safety Officer at the home office should be notified immediately, making sure that the area is not left unattended. This will enable the Radiation Safety Officer to notify the proper governmental agency.

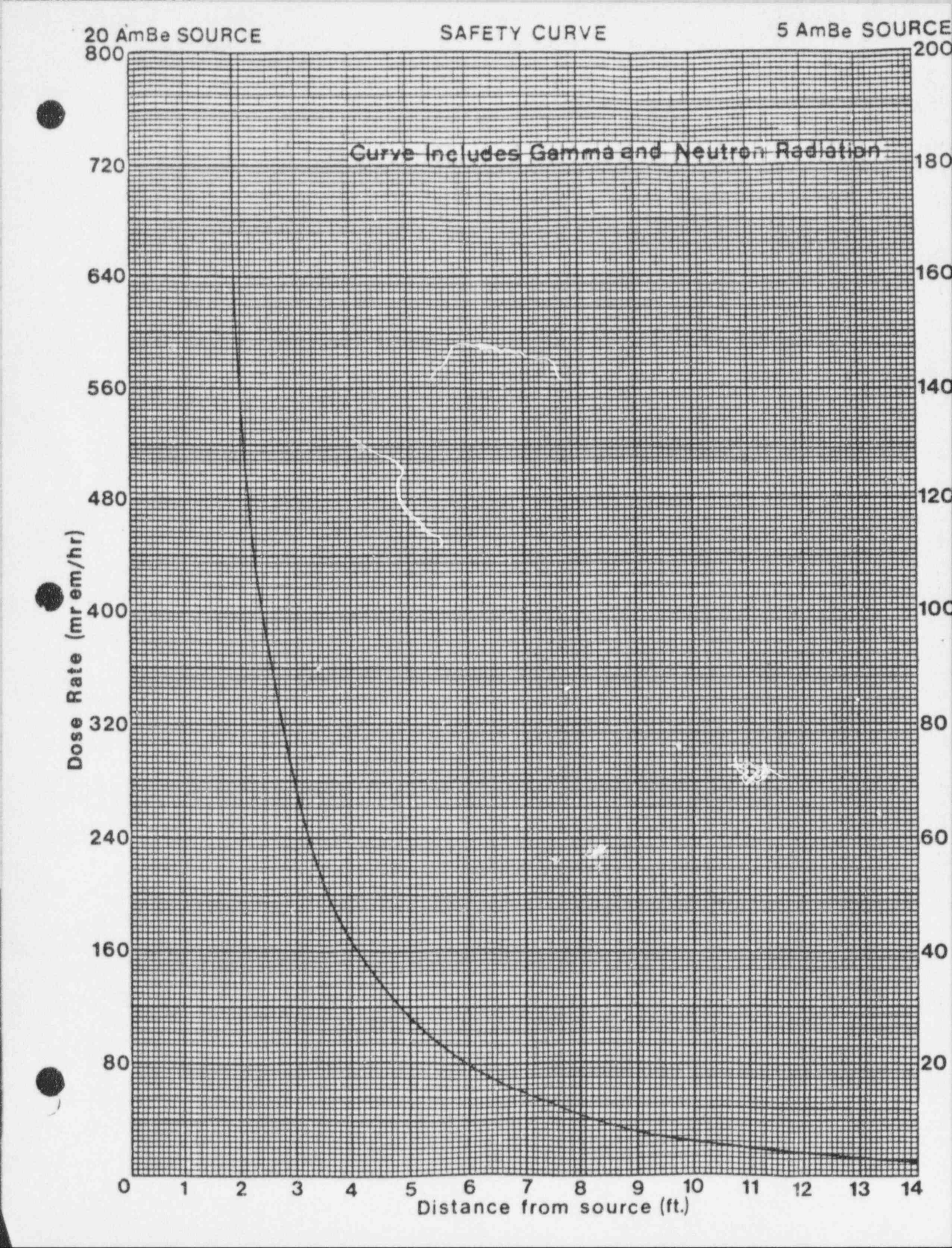
(2) Fire and Other Emergencies

(a) Notify all personnel in the area immediately
(b) Attempt to put out all fires if a radiation hazard is not immediately present
(c) Notify the fire department
(d) Notify the Radiation Safety Officer
(e) The Radiation Safety Officer wil set up restrictions governing the fire fighting and other emergency activities

(f) Following the emergency, monitor the area and ascertain the emergency devices necessary for safe decontamination.
(g) Decontaminate.
(h) The Radiation Safety Officer will have to approve the area before work can resume.
(i) Monitor all persons involved in combating the emergency.
(j) Prepare a complete history of the accident and report to the Radiation Safety Officer who will in turn report it to the proper State Agency.

(3) Leaking Source

(a) If a leak test indicates a leaking source, take the source out of active use.
(b) Perform a second leak test to confirm the initial results and submit for analysis.
(c) If the second leak test also indicates a leaking source consult the manufacturer for further instructions on disposal or repair of the source.


20 AmBe SOURCE
SAFETY CURVE
5 AmBe SOURCE
Curve Includes Gamma and Neutron Radiation
Dose Rate (mr em/hr)
800
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320
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9
10
11
12
13
14
Distance from source (ft.)

APPENDIX C

PROCEDURES FOR TRACER APPLICATIONS

1. Oil Field Tracer Applications

Selection of the isotope depends on the study to be performed. Listed below are the critical isotopes and some injection techniques.

Iodine - 131

The method of injection depends on the type of equipment available and the pressure and condition of the well. The following are desciptions of applicable techniques.

A. Liquid tracers can be inserted by means of a sampling bomb. A greater pressure can be exerted beyond the bomb than that of the item being worked on and the material is pushed into the well head.

B. Materials are placed in breakable vessels and attached to a logging device. When in the well they are exploded by use of a squibb charge.

C. The material can be poured or inserted by using a syringe directly into the well head. Used where no pressure is involved.

D. Where sand is concerned the sand is generally blended at the slurry hopper.

E. The sample bomb is lowered into the well end by using a turning device attached to a solenoid. The material is released into the flow.

F. An appropriate amount of the isotope is added to an injection tool which is controlled from the truck panel board permitting limited quantities of materials to be injected.

Studies are as follows: acidizing operations, cement channel locations, casing seat channel locations, oil injection profiles, flow calibrations, fracturing, permeability surveys, and water injection well profiles. In any one survey, no more than 10 mCi of liquid I-131 will be used.

II. Safety Precautions

Generally, the following safety facts should be known and observed when utilizing radioactive tracer materials.

A. Safety Through Distance - Distance can be an effective safety measure from a source. Safe distances should be known for the amounts of radioactive material being handled.

Examples of exposure rates at various distances from a 100 millicurie source:

Radioactive Material	3 feet mR	6 feet mR	9 feet mR
Iridium - 192	61	15.25	6.8
Iodine - 131	25	6.25	2.8

B. Safety Through Shielding - Certain materials are effective shields against radiation. The half layer value is the amount of shield necessary to reduce the radiation one-half.

Half-Layer value for some common materials:

Radioactive Material	Lead	Steel	Concrete
Cobalt - 60	0.49"	0.87"	5.0"
Cesium - 137	0.25"	0.68"	2.1"
Iridium - 192	0.19"	0.5"	1.9"

C. Safety Through Stay Time - The safety of an individual may be may be gained by controlling the amount of time he is exposed to radiation. If exposure attains an unsafe limit, personnel should be rotated.

III Health Physics Regarding Actual Field Studies

A. Monitoring job site before initiation of work and on completion to assure no contamination at the well site.

1. Using a low level survey meter, and before work initiation, monitor the area. Record the observation on a sketch of the area.

2. Certify the area clean before commencing operations.

B. Handling Equipment - The following items shall be worn at all times when handling the radioactive material.

1. Protective Gloves

2. Face Masks

3. Goggles

4. Protective Clothing

C. Personel Dosimeters

Personnel involved in operations involving licensed materials shall at all times wear TLD film badges. In addition, if involved in operations involving tracer materials, personnel will wear extremity dosimeters in the form of wrist TLD badges.

** Face masks shall be worn at all times when a gaseous radioactive material is being used in a field study. The face mask shall be a type approved by the National Bureau of Mines and should contain an excellent organic filter agent.

D. Film Badges-It will be mandatory for all personnel working in the restricted area (an area greater than 2 mR/hr) to wear a film badge.

IV. Tracer Packaging

All packages received from the suppliers containing radioactive materials shall be monitored prior to their leaving their facilities. The dosage limits shall comply to the DOT shipping regulations which are a maximum of 200 mR/hr at the surface of a shipping container and a maximum of 10 mR/hr at a distance of one meter from the surface of the container.

V. Handling and Field Equipment Check List

The specific application will require additional radiation detection equipment than that listed below, but, generally the field equipment will consist of the following items:

-First aid kit
-Kim-Wipes (industrial type)
-Sponges
-Large and small polyethylene storage bags for containing contaminated equipment, sponges, etc.
-Protective clothing
-Two remote handling tongs
-Masking and plastic electrical tape
-Plastic wash bottles
-Rubber gloves
-Labels for the return of radioactive waste
-Dosimeter and charger
-Film badges
-Concentrated wash solution
-Low Level survey meter (o - 50 mr/hr)

VI. Operating Procedures

A. Pre-job knowledge and planning-the Radiological Safety Supervisor must know:

1. Types of radiation involved.
2. Intensity of radiation.
3. Relative hazard of each type of radiation.
4. What the "stay time" (maximum allowable exposure time) is.
5. What the possible contamination problems are.
6. Any internal contamination problems.
7. What industrial nuisance removable contamination will create.
8. What controls must be dictated to protect personnel.
9. Plan methods for controlling access to radiographic area.

B. Specific procedures will vary with the individual job applications. In general, the following procedures should be followed:

1. Plan the job in advance.
2. Monitor the area and measure the background radiation level.
3. Optimum mixing location should be selected. Radioactive material should be mixed with injection fluid as close to well head as possible.
4. Define the area which is prohibited to unauthorized personnel. (2 mr/hr is the maximum allowable radiation to people not wearing film badges).
5. Mix radioactive material with injection fluid with special consideration given to splashing, wind conditions, and any other outside influence which could interfere with the safe handling or the material.
6. Plastic or rubber gloves should be worn at all times while handling radioactive materials. If wind velocity is sufficient to cause blowing, goggles and respirator should be used.

7. Exposure time should be controlled. If exposure approaches the maximum permissible limit, personnel should be rotated.
8. Allow no eating, smoking, or drinking in the restricted area.
9. Following the completion of the operation, the entire area should be monitored.
10. Radioactive Contamination Inspection Data Sheet should be filled out and given to customer.

VII. Emergency Procedures

Emergencies vary greatly in their respective hazards. Sometimes these emergencies are in the form of spills, fires or explosions which consequently, result in the spread of radioactive contamination. Emergency procedures contained in the National Bureau of Standards, Handbook No. 48, are given here as a guide. It must be recognized that these procedures are general and any specific emergency would certainly involve additional procedures not specifically covered in this outline.

1. Spills involving no radiation hazard to personnel:

   a. Notify all personnel in the area at once.

   b. Permit only a minimum number of personnel in the vicinity of the spill.

   c. Confine the spill immediately.

   d. Notify the Radiation Protection Officer.

   e. Decontaminate.

   f. Monitor all personnel involved in the spill and cleaning.

   g. Permit no person to resume work in the area until it has been surveyed and approved by one of the approved individual users specified on the U.S. NRC and/or Agreement State Radioactive Material License.

2. Spills involving radiation hazard to personnel:

   a. Notify all personnel not involved in the spill to vacate the area at once.

   b. If the spill is liquid and the hands are protected, right the container.

   c. If the spill is on the skin, flush thoroughly.

   d. If the spill is on the clothing, discard outer or protective clothing at once.

   e. Switch off all fans. Vacate the room.

   f. Notify the Radiation Protection Officer as soon as possible.

   g. Take immediate steps to decontaminate the personnel involved.

   h. Decontaminate the area.

   i. Permit no person to resume work in the area until a survey is made and approval of the Radiological Safety Officer is secured.

   j. Prepare a complete history of the accident, and give details in the Emergency Procedures Report.

3. Injuries to personnel involving radiation hazards:

   a. Wash minor wounds immediately under running water while spreading the edges of the gash.

   b. Call a physician, preferably one who is qualified to treat radiation injuries.

   c. Permit no person involved in a radiation injury to return to work without the approval of the attending physician.

   d. Report all radiation accidents (wounds, over-exposure, injestion, inhalation) to your supervisor.

e. Prepare a complete history of the accident and give the details in the Emergency Procedures Report.

4. Fire and other major emergencies:

a. Notify all personnel in the area at once.

b. Attempt to put out all fires if radiation hazard is not immediately present.

c. Notify the Fire Department

d. Notify the Radiological Safety Officer.

e. Govern the fire fighting or other emergency activity by the restrictions of the Radiological Safety Officer.

f. Following the emergency, monitor the area and determine the emergency devices necessary for safe decontamination.

g. Decontaminate.

h. Permit no person to resume work without approval of the Radiological Safety Officer.

i. Monitor all persons involved incombating the emergency.

j. Prepare a complete history of the accident and give the details in the Emergency Procedures Report.

VIII. Monitoring Techniques for Personnel

All personnel directly related to activity involving radioactive materials will wear a TLD and, in tracer operations, a wrist TLD. TLD records will be quarterly and monitoring will be at least on a quarterly basis.

It is clearly understood that maximum acceptable dose levels are not to exceed 1.25 Rem. per calander quarter or no more than 5.0 Rem. per calender year.

It is also clearly understood that in the event these doses are greater than those listed above that proper notification will be posted with the licensing authority. Also reports of dosages will be maintained on at least a quarterly basis.

IX. Transporting Radioactive Materials

1. Prior to transporting any licensed materials, shipping papers must properly filled out according to Subpart C of 49 CFR Part 172. Shipping papers must be carried on transport vehicle.

2. Proper labeling of shipping containers is determined by the following guidelines:

Radioactive Yellow III: Not to exceed 200 mr/hr at surface of package and not to exceed 10 mr/hr at 1 meter. Package shall be labeled with 2 "Type III" labels. Transporting vehicle must be labeled on all four sides with "Radioactive" signs.

Radioactive Yellow II: Not to exceed 50 mr/hr at surface of package and not to exceed 1 mr/hr at 1 meter. Package shall be labeled with 2 "Type II" labels.

3. All transport containers must be secured to transport vehicle by a locking device.

4. Proper method of securing transport containers is to be use of chain and padlock to a permanent fixture of transport vehicle.

5. Placards on vehicle containing Radioactive Yellow III containers will conform to DOT regulations.

6. After securing container in transport vehicle, vehicle will be surveyed on all four sides and in passenger compartment. Readings must not exceed 2 milliroentgens per hour at any exterior surface or in the passenger compartment. If radiation level exceeds 2 milliroentgens per hour in passenger compartment, source container can be moved to another location in transport vehicle or the passenger compartment may be shielded. If vehicle is used as temporary well site storage, it must be posted- "Caution-Radioactive Material". Vehicle left unattended must be locked.

X. Safety Procedures for Handling Radioactive Tracers.

A. Introduction-In order to give proper safety considerations to the various radioactive materials used in tracer surveys, the following information should be understood by all field users. The relatively low activity levels of the tracer units allow some latitude in handling techniques such that moderate safety precautions are sufficient.

The major safety problem is the prevention of ingestion of radioactive materials into the body. The activities typically used are from 100 to 10,000 times the tolerable limit for internal accumulation. The degree of this particular hazard depends on the biological activity of the isotope, its halflife, and the nature of the tracer preparation.

B. PROCEDURES FOR HANDLING LIQUID RADIOACTIVE TRACERS

The procedures for handling liquid radioactive tracers vary widely because of the type of tracer and the variety of the type of equipment used to inject a well with the tracer.

The tracers are usually shipped in 15 cc french square glass bottles with a wide mouth. These bottles are usually inside a lead bottle which is mainly used for shielding purposes.

In most cases a bottle of tracer will contain 10 cc of active material. This fluid is the carrier and the manufacturer will generally add Sodium Iodide solution to the small quantity usually less than .01 cc of active material to reduce surface evaporation of Iodine-131. The manufacturer will generally add low concentration 0.1 N Hydrochloric acid to the acid soluble Sodium Iridium-192 chloride, Scandium-46 chloride. These are the common tracers. Iodine-131 is the most popular because of the medium gamma energy and short half life. Iodine also lends itself to a variety of functions making it a valuable tracer in oil, gas or water studies.

In some cases, tracers are ordered in test tubes generally the intent is to place the test tube against a charge lower it into a well and break the test tube by exploding the charge. This technique is antiquated and generally the material is placed in the dump baler.

Most tools use a piston driven traceejector tool which permits the operator to control the amount of fluid or tracer he wishes to inject into the well from the operating truck at the surface. The traceejectors are loaded by simply pouring the tracer into the tool or if more care is utilized the ejector is loaded using a hypodermic syringe to avoid spilling and spreading contamination.

Precautions:

*Protective clothing should be worn.

*All tracers should be handled with disposable plastic gloves.

Please remember that tolerances are not meant for working levels but as maximum safe levels only, and that the objective should be to obtain a minimum exposure during tracer operations. This can be accomplished by working as rapidly, yet carefully, as possible with the tracer units and also by distributing the actual direct handling of the unshielded materials among as many qualified people as possible.

C. Contamination Survey Techniques

1. Surveying of Area and Equipment

The ideal mixing and injection operation would have no spills and leave no residue of tracer material in any of the vessels or pipes through which the tracer was injected. In practice such an ideal may not be realized, and a survey of the area is necessary so that the proper procedures may be followed to assure that no remaining contaminant can cause harm to company personnel, the customer's personnel, or the general public.

The survey meter must be used with the beta shield open to survey the entire area where mixing has been done, and the pipes and associated components through which the mix was conducted to the well, to be sure that no concentration remains that may cause harm, either by external radiation or by possible contamination of food or water supplies.

Contamination of the probe must be avoided completely. If any contact survey is made, the probe is to be protected with a sheet of paper between the object and probe. A contaminated probe can render the survey meter useless for low level measurements.

Spills should be cleaned up and, if possible, injected into the well with the main tracer unit. The area of the spill should then be surveyed with the probe approximately one inch above the surfaces.

Any areas or items of equipment which indicate any amount of detectable radioactivity, above background, shall be considered contaminated and appropriate measures taken to remove such concentrations. (See Paragraph D)

2. Surveying of Individuals

The greatest care in survey measurement is taken on items of personal equipment such as shoes, gloves, clothing and handling tools, as well as exposed portions of the body of personnel working with radioactive materials. This is because of the much greater probability of ingestion from such items.

The survey meter should also be used with the beta shield open to read the radiation level of clothing worn by the individual performing the mixing operation or any other clothes suspected of contamination. This should be done immediately following the mixing operations. If any indication of radioactive contamination is found on items of clothing, equipment, etc., or on the person of personnel involved in the operation, every effort should be made to remove the activity. (See Paragraph D for decontaminating.)

D. Decontamination Procedures

The radioactive tracer preparations are down by factors of 50 to 200 below the dangerous levels for external radiation hazards. The major hazard involved with these tracer preparations is the factor of ingestion. The ingestion tolerance is from one part per thousand to one part per ten thousand of the typical activities used. Thus, great care is exercised by company personnel to avoid contamination of hands, clothing and

other personal items. Accidental concentrations of radioactive material are cleaned up, dispersed, or disposed of safely.

1. Determination of contamination is accomplished with the use of the survey meter. If contamination is suspected or after the logging operation is complete, an area survey is to be implemented. If any area shows a reading higher than normal background, decontamination procedures will be initiated.

2. If contamination is detected, and the area is confined, company personnel will decontaminate. If, however, the contaminated area is widespread with a reading on the survey meter of over 1 MR/HR, contact the RPO. A firm specializing in the field of decontamination will be brought in. With a survey reading over 2MR/HR, contaminated area must be fenced and posted. At this point the NRC will also be notified.

3. The equipment used in decontamination procedures are to include-film badges-disposable gloves-face masks-goggles disposable wipes-refuse bags-survey meter.

4. Decontamination will be effected by wiping liquid spills with disposable wipes. Contaminated soil will be put in plastic sealable refuse bags. Bodily contamination will be flushed with water and the wash water contained. All waste items will be sealed in refuse bags, dated, and placed in R/A bunker until such time as they may be disposed of.

5. To prevent personel contamination during decontamination procedures, all personnel shall wear disposable gloves, face masks, film badges, goggles, and protective clothing. Avoid any direct contact with contaminated items.

6. After decontamination procedures have been completed, the area will be surveyed again to verify the effectiveness of the procedures. All reports, both before and after logging and before and after decontamination, will be kept on file for no less than 3 years.

7. In case of any problems or if you have any questions about decontamination procedures, contact David Franklin- company RPO.

8. Company personnel will execute only simple decontamination procedures. If there is extensive contamination or high radiation levels, emergency procedures will be initiated and the RPO contacted.

9. In the event that contamination is noted in well fluids being flowed back or in drilled out cement, the RPO will be contacted and the contaminated fluids or returns will not be left unattended by company personnel. The NRC will be notified of the condition.

CHART A – HAND EXPOSURE FROM RADIOACTIVE TRACERS

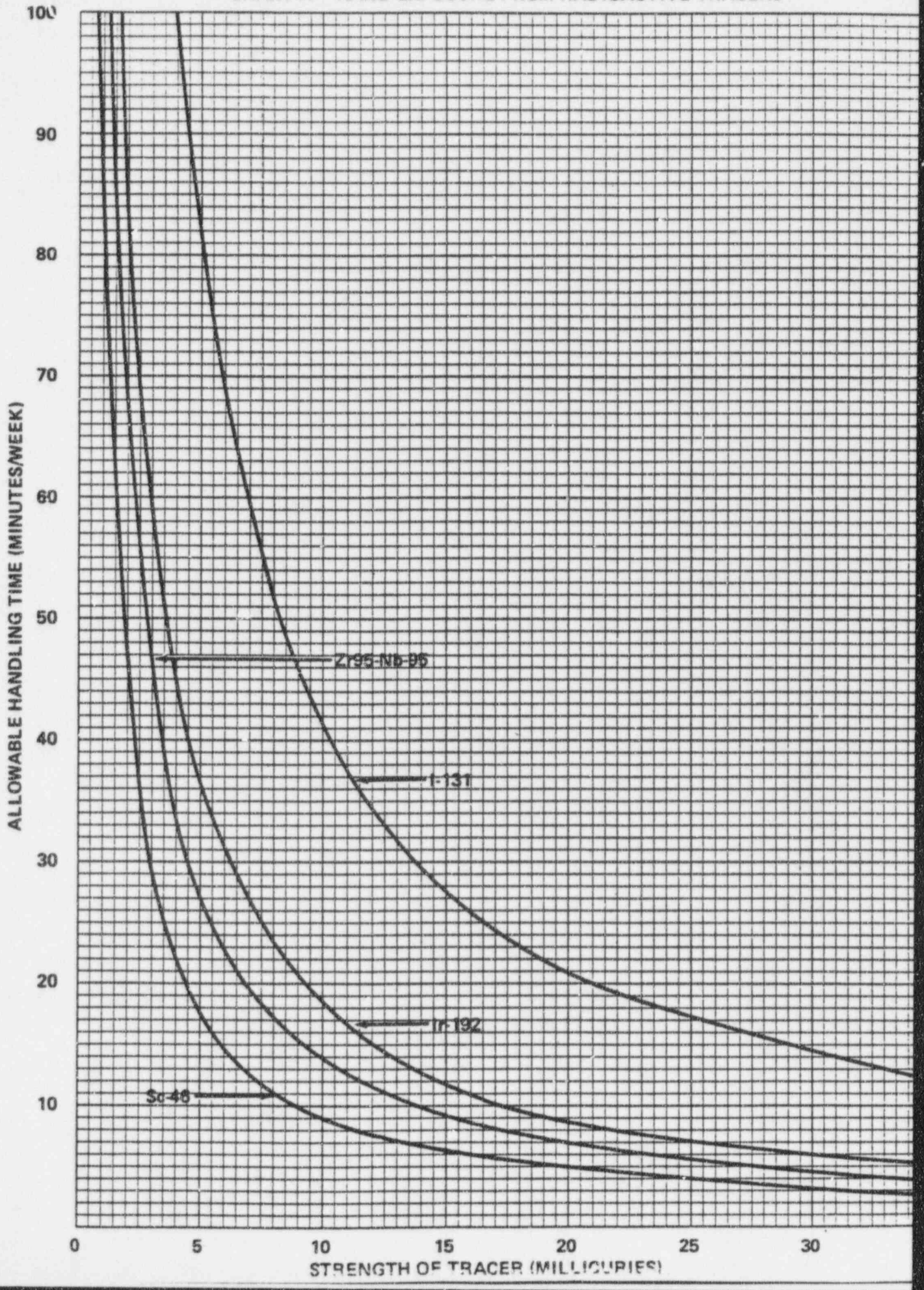


CHART B – RADIATION LEVELS AT ONE FOOT FROM UNSHIELDED RADIOACTIVE TRACERS

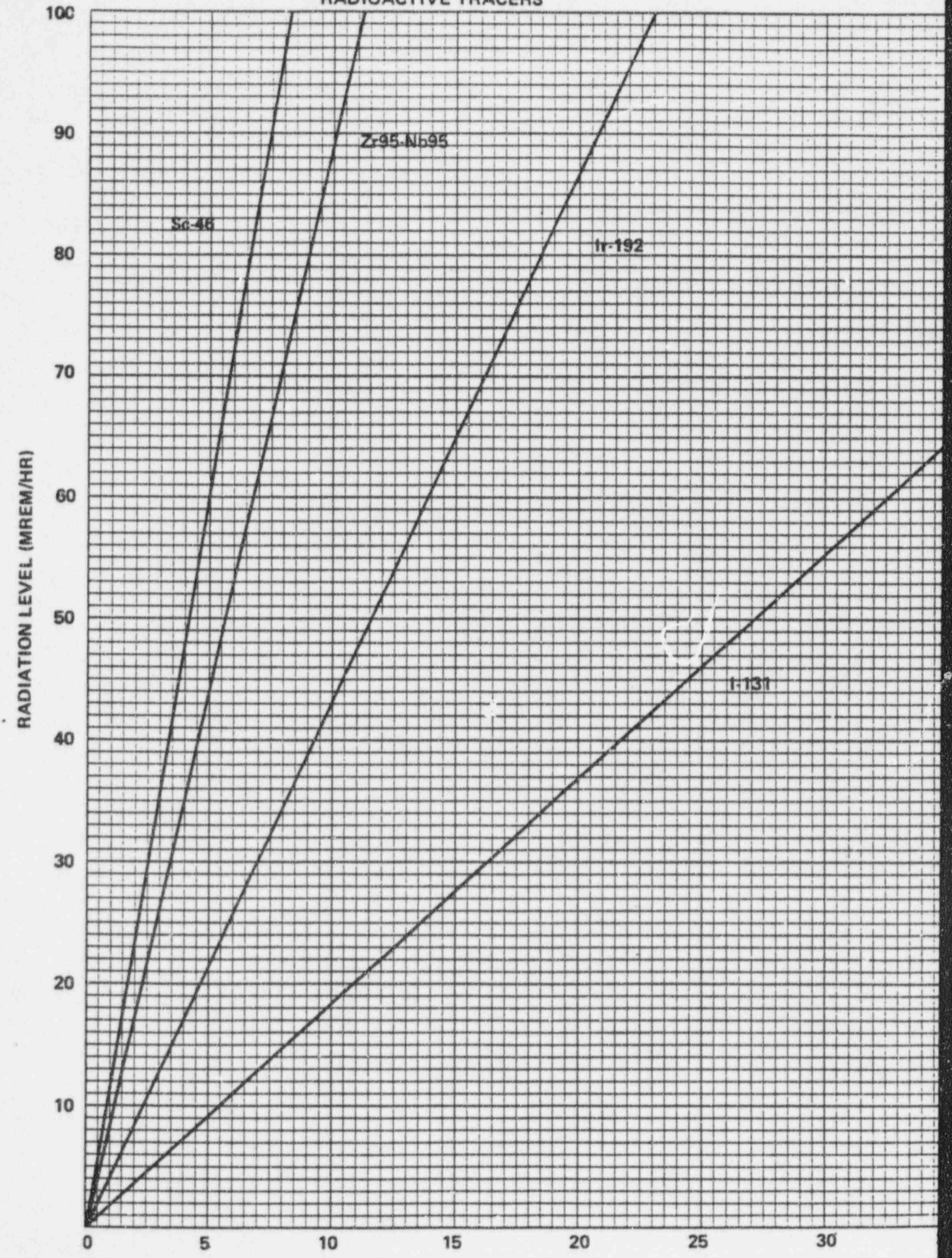
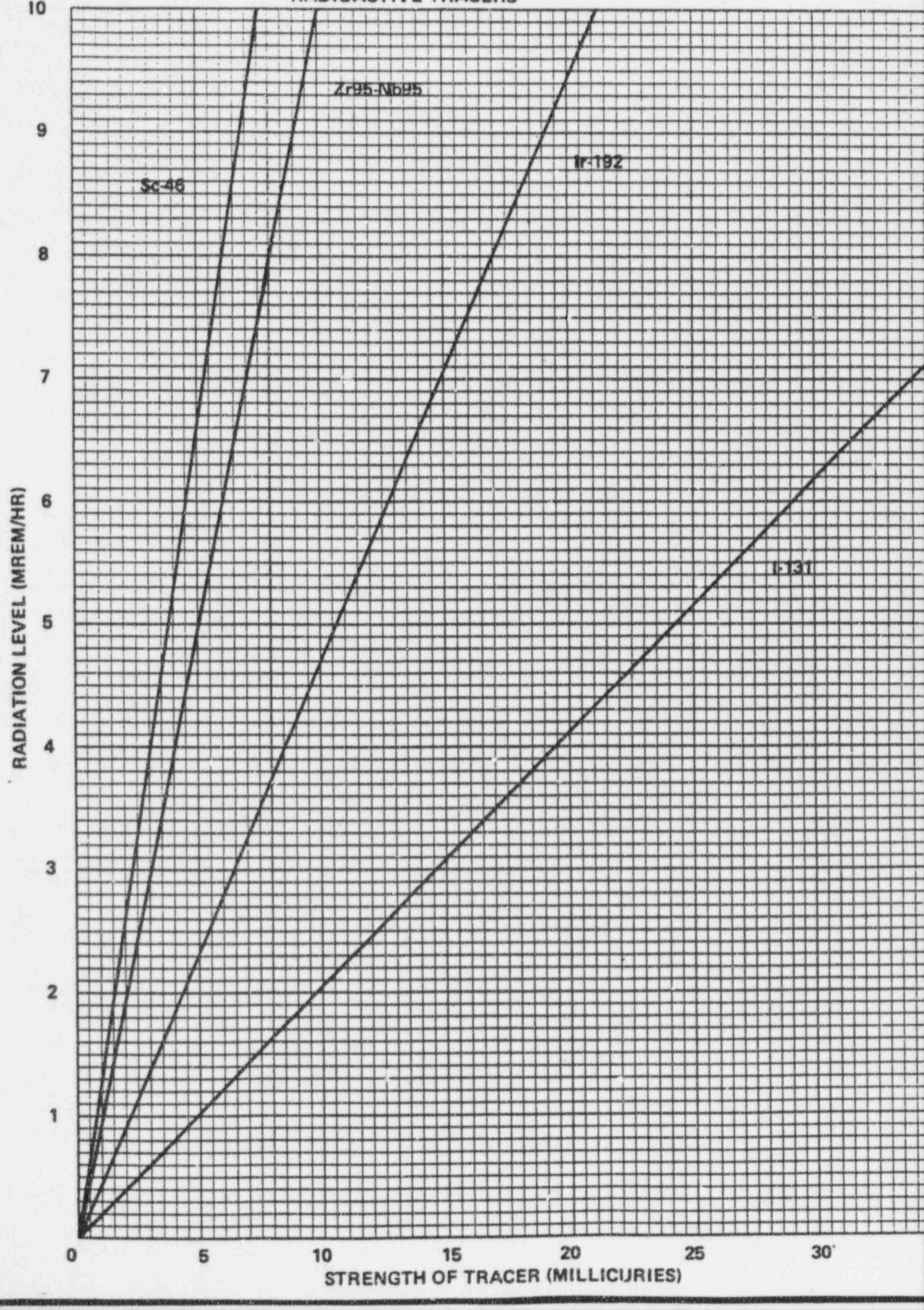


CHART C – RADIATION LEVELS AT THREE FEET FROM UNSHIELDED RADIOACTIVE TRACERS



APPENDIX D

PROCEDURES FOR LOST SOURCE DOWNHOLE

A. Decision on Recovery of a Source

B. The Company's Responsibilities

C. Recovery or Abandonment of a Source

D. Summary

APPENDIX D

This area is an expansion of part V of Appendix B.

A. Factors influencing the decision on recovery of a source when stuck in an oil well.

   1. Cost of the tool versus best estimate of minimum cost and probable maximum cost of recovery.

   2. The risk of sticking a drill stem and fishing tools, especially if all zones of interest are above the tool.

   3. Interference of the tool with potential production and deeper drilling.

   4. Value of clearing the hole for additional logs.

B. When a radioactive source is associated with stuck equipment, the Company becomes more actively involved. Our responsibilities are:

   1. Remain in contact with the client and offer our best advice and recommendations regarding safe fishing procedures.

   2. Take care to recognize the possibility that a fishing procedure might damage a source capsule.

   3. Notify the Nuclear Regulatory Commission or State if it becomes apparent that it be desirable to or advisable to abandon the source in the well.

C. The introduction of the regulatory agencies does not alter the main objectives: to recover the source intact or abandon it in such a way as to protect personnel and property in the future.

   1. If abandonment of a source appears imminent, the Company notifies the Nuclear Regulatory Commission and State by telephone. We then attempt to determine which line of action is to the best interest of all concerned, what the client wishes to and can reasonably do, and to present a packaged proposal to the agencies for final approval or further recommendations.

2. Abandonment of a source in a dry hole is simple. All records, including those of the state agency issuing permits for or controlling the drilling of oil and gas wells, should contain information regarding the depth, date, type and quantity of radioactive materials. The well head, if left above the surface, should contain the same information on an engraved durable metal placard.

3. A source left below a producing zone presents little difficulty. In most cases the normal cementing of the production string of casing or tubing will isolate the source (Figure 1). If the well is to be produced from open hole completion, cement should be spotted around and/or above it to prevent the movement of fluids past the capsule and eventual destruction of the capsule through abrasion (Figure 2).

4. In questionable cases the life of the capsule and the solubility of radioactive materials might influence the acceptance of the proposal. (The Company's source capsules have an estimated life of 500 years in undisturbed salt water. The solubility of the radioactive materials is in the order of one part per billion per week).

5. Production of gas, water or oil past a source should be prohibited unless the capsule is protected from abrasion. Casing or tubing should be adequate. The spotting of cement, if pratical and feasible, adds to the protection (Figure 3). Care should be taken in setting casing past the location of the tool to avoid dislodging it. A gamma-ray survey run after the casing is below the zone will give assurance that the tool and source will not be encountered and damaged at a lower level.

6. In the event a source is left in a producing zone it should be cemented in place if possible. Extreme caution should be used in side tracking to avoid reentering the original hole and damaging the source container (Figure 4). Normally, the source is at or near the bottom of the tool. If there were sufficient clearance to place cement around the source the tool would, in most cases, be retrievable. However, the drilling mud would

probably harden in a short time to prevent appreciable flow of fluids by the source. In addition, the separation between the new and original hole would reduce the rate of flow at the tool to a very small figure. It is recommended that the new and old holes be separated by at least 15 feet to preclude any possibility of damage to the source by perforating.

A gamma-ray source abandoned in a well cannot "induce" radioactivity in gas, oil, water, or other materials. For all practical purposes the same may be said of 3 curie, 5 curie and 20 curie AmBe neutron sources. Although neutron flux at one foot from a 3 curie, 5 curie or 20 curie source is negligible in this respect. For example, the flux in a reactor used to activate a cobalt-60 "Pip" tag to 10 microcuries is hundreds of millions times greater that that at one foot from a 5 curie source. Although it is not precisely correct to say that there is no activation, induced radioactivity would be almost immeasurable initially and through decay would be totally obscured by natural background radiation long before the material reached the surface.

D. Summary

1. All precautions should be taken to avoid rupture of a radioactive source during fishing operation. Although each source has been individually pressure tested to 25,000 psi, it is small and will not withstand milling, drilling, or pounding fishing operations.

2. A radioactive source which is intact may be safely abandoned in the well. The decision as to whether to abandon a tool with a source would be based on the accepted considerations for abandoning any other type tool. Added guidelines are the safety aspect, the proper placarding of the well and enterning the information in the well records.

3. There should be no costly delay in obtaining approval to abandon a radioactive source in as much as the Company keeps the agencies well advised of the progress of the fishing operations as events develop.

4. Responsibility for notifying the regulatory agencies and making all reports is the Company's.

5. It is the client's responsibility to deal with the State agencies issuing permits for drilling oil and gas wells and to furnish that agency with any information which may be required.

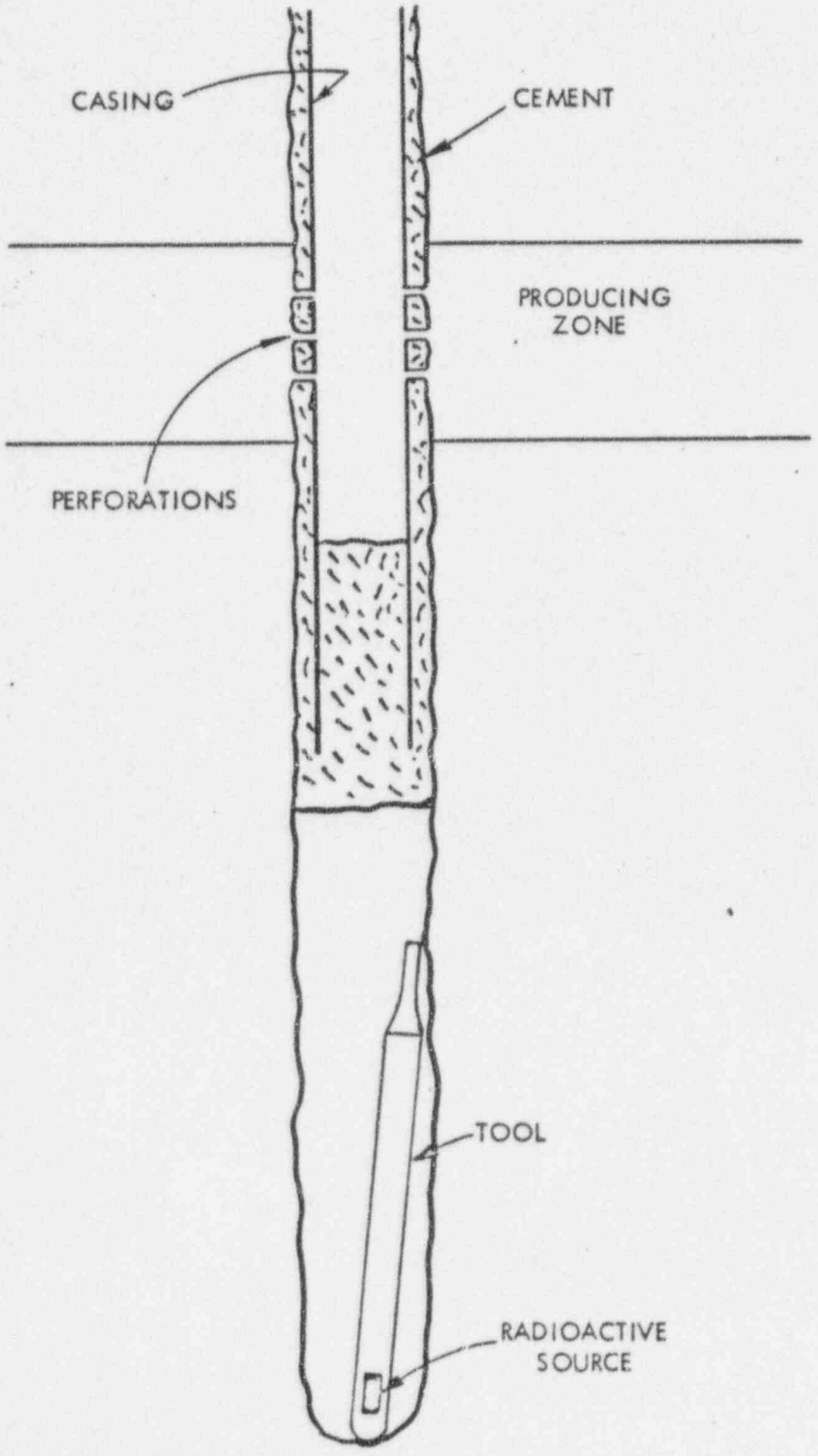

CASING
CEMENT
PRODUCING ZONE
PERFORATIONS
TOOL
RADIOACTIVE SOURCE

FIG. 1

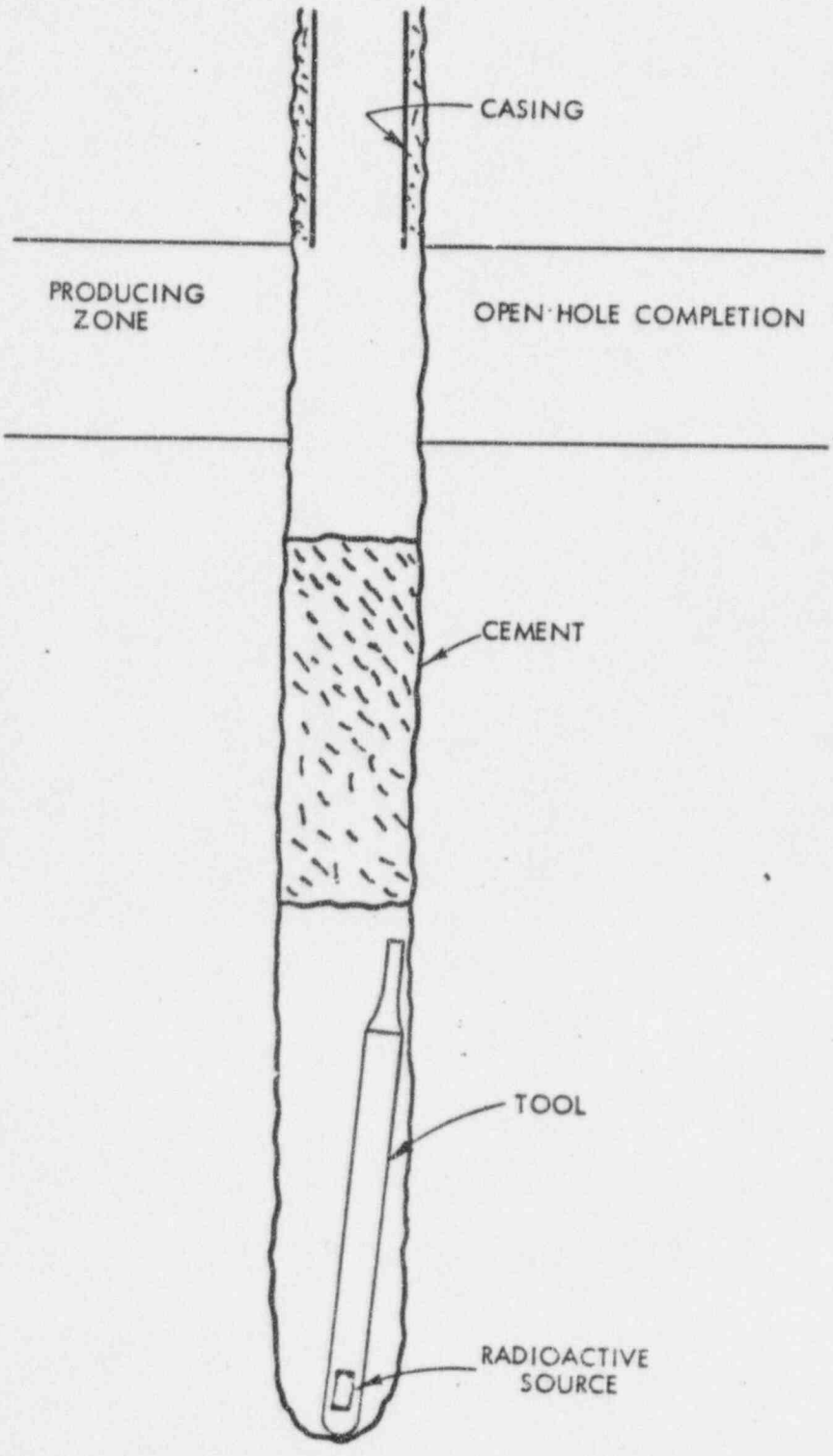

CASING
PRODUCING ZONE
OPEN HOLE COMPLETION
CEMENT
TOOL
RADIOACTIVE SOURCE

FIG. 2

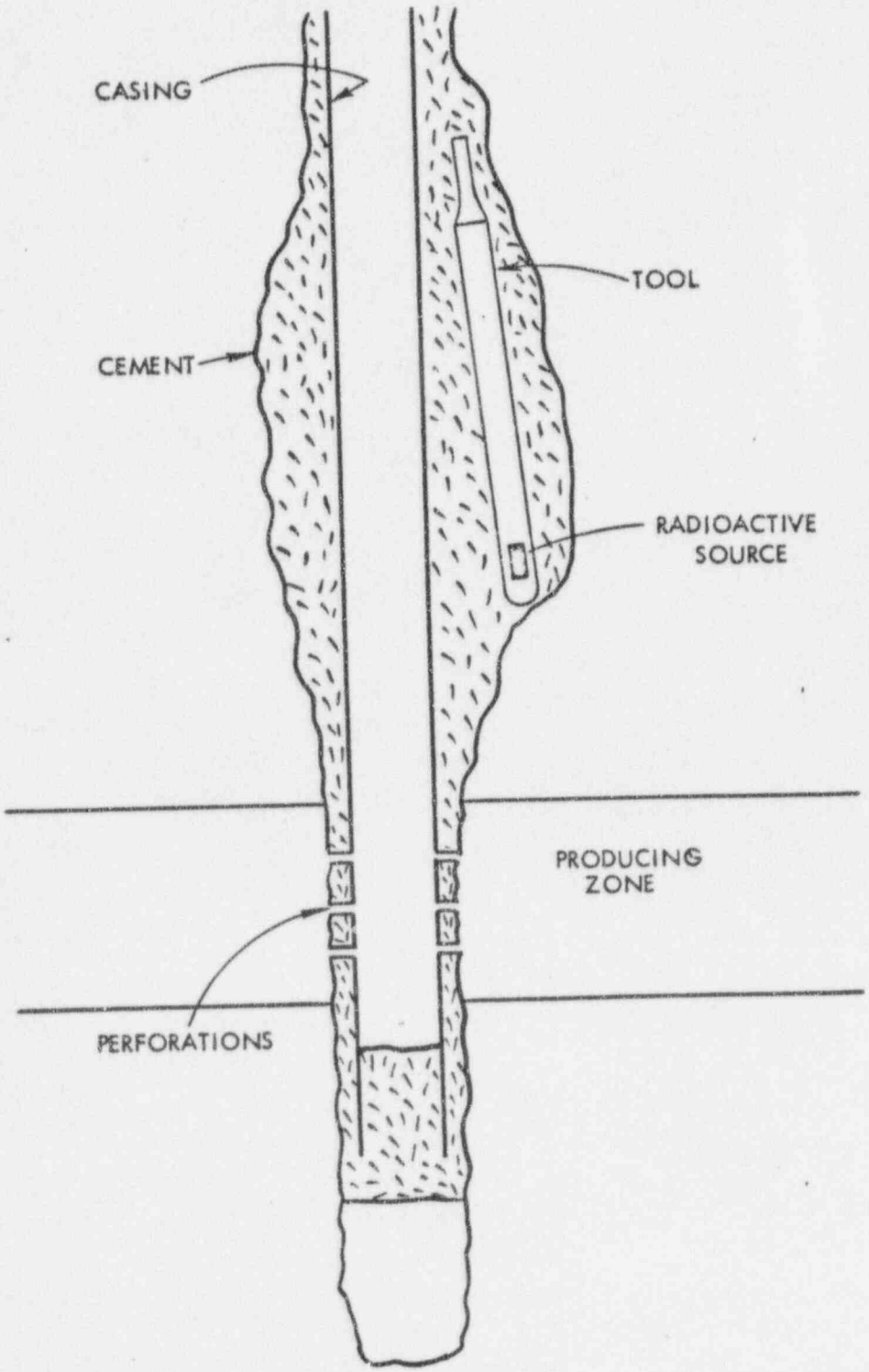

CASING
TOOL
CEMENT
RADIOACTIVE
SOURCE
PRODUCING
ZONE
PERFORATIONS

FIG. 3

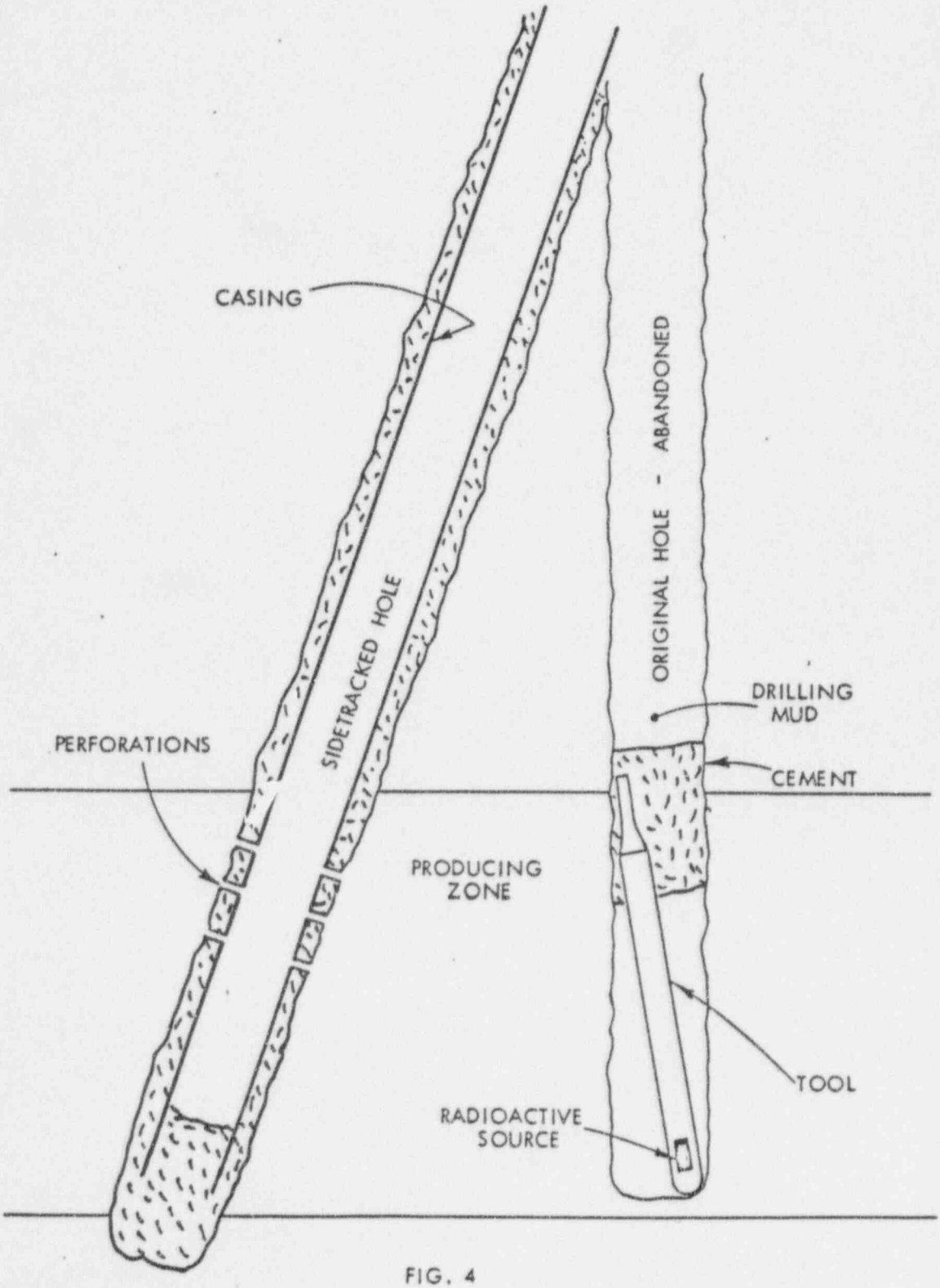

CASING
SIDETRACKED HOLE
ORIGINAL HOLE - ABANDONED
DRILLING MUD
PERFORATIONS
CEMENT
PRODUCING ZONE
TOOL
RADIOACTIVE SOURCE

FIG. 4

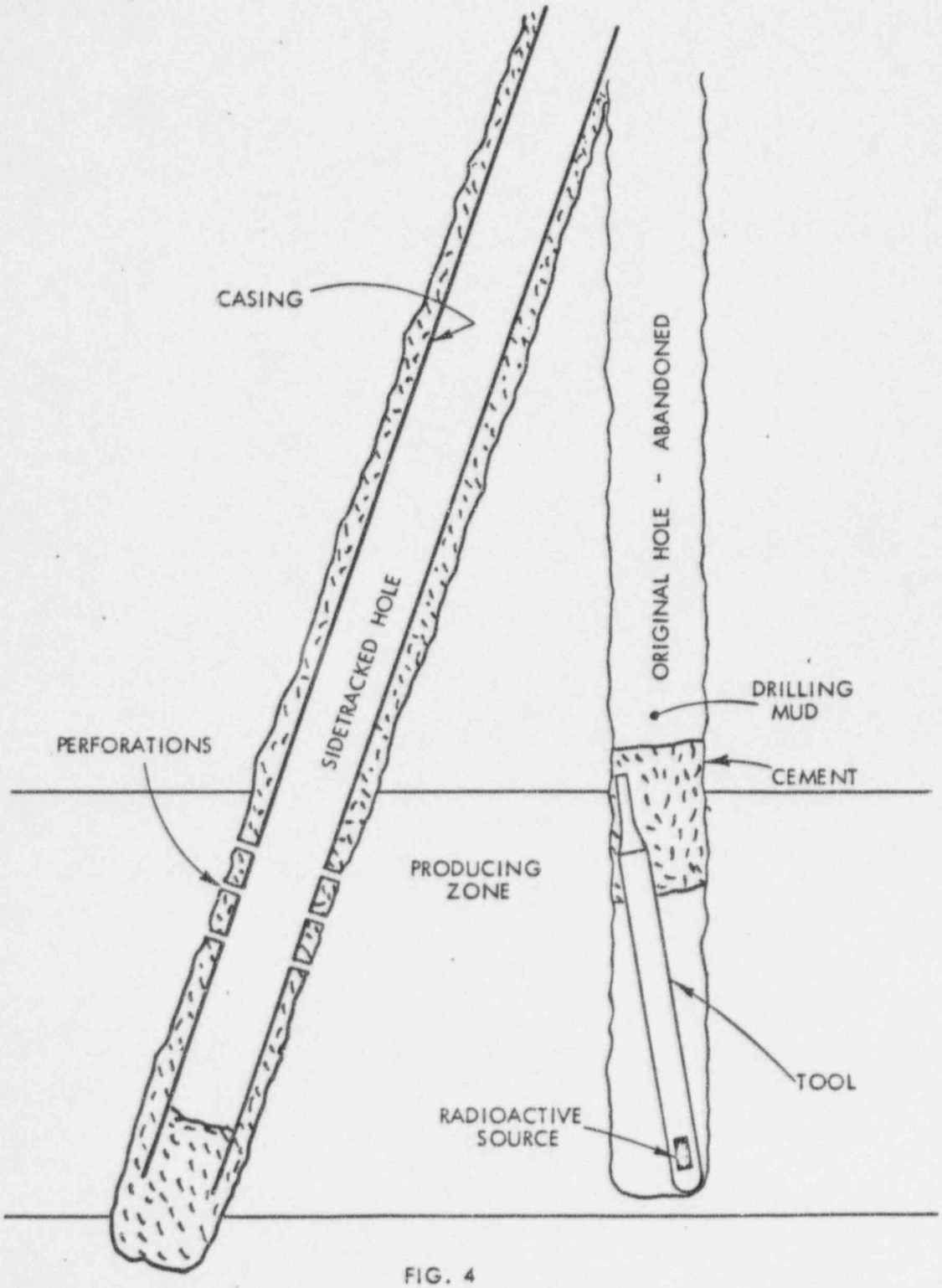

CASING
SIDETRACKED HOLE
ORIGINAL HOLE - ABANDONED
DRILLING MUD
PERFORATIONS
CEMENT
PRODUCING ZONE
TOOL
RADIOACTIVE SOURCE

FIG. 4

10.7 Leak Testing

Perforating Services Inc. uses a LTK-1 leak test kit supplied by Gulf Nuclear Inc. 100 NASA Road One Suite 411, Webster, Texas 77598 License No. Texas 11-2995 Instructions for use are supplied with kit.

10.8 Physical Inventory

Semiannual inventory of all licensed material will be conducted by Perforating Services Inc. RPO. Inventory Form is included with this application.

10.9 Semiannual Maintenance

Perforating Services Inc. will perform semiannual maintenance inspections of all logging tools, survey instruments, handling tools, and all equipment used in conjunction with licensed materials. Any defects will result in the removal of the item from service. A report will be made listing the defect, and the steps taken to correct the defect. In the inspection, check to make sure that all labels are ledgible and that there are no visual defects such as damaged threads or broken pieces.

10.10 Removal or Maintenance on a Sealed Source or Holder

Perforating Services Inc. will not perform any maintenance procedures on sealed sources or source holders.

10.11 Sealed Sources Stuck in a Source Holder

Perforating Services Inc. will <u>not</u> attempt to remove a sealed source that is stuck in a source holder by drilling, cutting, chiseling, or any other means that might violate the integrity of the sealed source.

10.12 Opening, Repair, or Modification of Sealed Source

Perforating Services Inc. will <u>not</u> open, repair, or modify any sealed source.

10.13 Tracer Studies in Fresh Water Aquifers

Perforating Services Inc. verifies that it will not intentionally inject any radioactive tracer isotope into a fresh water aquifer.

10.14 Radioactive Markers

Perforating Services is not licensed for radioactive markers.

Item 11 - Waste Management

1. In the case of a sealed source, disposition will be effected by returning the source to the original supplier or an authorized recipient.

2. In the case of waste tracer materials, the following procedures will be undertaken:

   a. The radioactive waste material will be held in proper storage for at least 10 half lives. (I-131 is 3 months)

   b. Prior to disposal, waste materials will be surveyed to ensure that radiation levels are indistinguishable from background levels in a low background area with all shielding removed.

   c. All radioactive labels and markings will be removed or defaced prior to disposal.

   d. A record of the surveys be kept on file for a period of at least 3 years.

   After all of the above criteria have been met, liquid I-131 will be disposed of in a sewage system.

A. EMERGENCY PROCEDURES REPORT

1. Customer: _____

_____

_____

2. Customer's Supervisor: _____

3. Company Supervisor: _____

4. Cause of Emergency: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

5. Source or Isotope: _____

6. Quantity of Isotope (curies) believed to have been spilled:

_____

7. Safety precautions immediately enacted: _____

_____

_____

8. Was there a suspected overdose and if so, who?

1. _____

2. _____

3. _____

4. _____

9. Personnel radiation survey for those working in the Restricted Area:

	Name	Head	Face	Body	Hands	Legs	Feet
1.	_____	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____	_____

10. On the sketch of the job site, mark the location of the exact spill: ___

_____.

11. Make an isodose chart if the level of the spill is greater than 10 mr/hr @ 1 foot.

a. one foot: _____

b. three feet: _____

c. six feet: _____

12. Check the air space for contamination: _____

13. Results of wipe tests after clean up procedures are undertaken:

Position #1: _____

Position #2: _____

Position #3: _____

14. Suggestions to future prevention of this accident: _____

_____

_____

_____

_____

_____

_____

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_____

_____

_____

_____

_____

_____

_____

Field Engineer
signature _____ _____

noted:
RPO signature _____ Date_____

Semiannual R/A Inventory

SEALED SOURCES:

Make & Model of Source _____ _____

Strength _____ _____

No. of Sources _____ _____

Where Stored _____ _____

TRACER MATERIALS:

Isotope _____ _____

Strength (mCi) _____ _____

Volume (cc) _____ _____

Where Stored _____ _____

Date _____

Signature of RPO _____

Date _____

ompa _____ Well _____

eld _____ County _____ State _____

perator _____ Servicemen _____

ngineer _____ Other Personnel _____

ob Ticket No. _____ District _____

ype Meter _____ Serial No. _____ Date Calibrated _____

Monitoring Procedure Before Leaving Shop
Truck Loaded (Before Leaving Shop)

ackground Count _____ mr/hr. (50 ft. clear of R/A Material)

ource No. _____ Isotope _____ Strength _____

racer Type _____ Strength _____

ack Sign _____ Front Sign _____ Right Sign _____ Left Sign _____

Monitoring Procedure Before Operations Begin

ackground _____ mr/hr.

ellhead _____ Rubber Hose & Fittings _____ Gloves _____

andling Tools _____ Engr. Hands & Clothing _____ Ejector Tool _____

rea where work is to be performed _____

Monitoring Procedure After Operations Complete

ellhead _____ Rubber Hose & Fittings _____ Gloves _____

andling Tools _____ Engr. Hands & Clothing _____

rea where work performed _____ Thyroid Check Engr. _____

itness _____

Additional Personnel Name		Additional Personnel Witness	
_____ No. 1 _____	mr/hr.	_____ No. 1 _____	mr/hr.
_____ No. 2 _____	mr/hr.	_____ No. 2 _____	mr/hr.
_____ No. 3 _____	mr/hr.	_____ No. 3 _____	mr/hr.
_____ No. 4 _____	mr/hr.	_____ No. 4 _____	mr/hr.

act location of any significant contamination _____

teps taken to remedy _____

mount of Tracer taken on job _____ Amount used _____ mc

isposition of leftover Tracer _____

Truck Monitoring Before Leaving Job Site (Loaded)

ack Sign _____ Front Sign _____ Right Sign _____ Left Sign _____

Truck Monitoring After Unloading at Shop and Material Put into Proper Storage Area

ack Sign _____ Front Sign _____ Right Sign _____ Left Sign _____

ake in Triplicate: (1) Attach to Job Ticket (2) Retain at District Office (3) Fort Worth

MONTHLY VEHICLE SURVEY

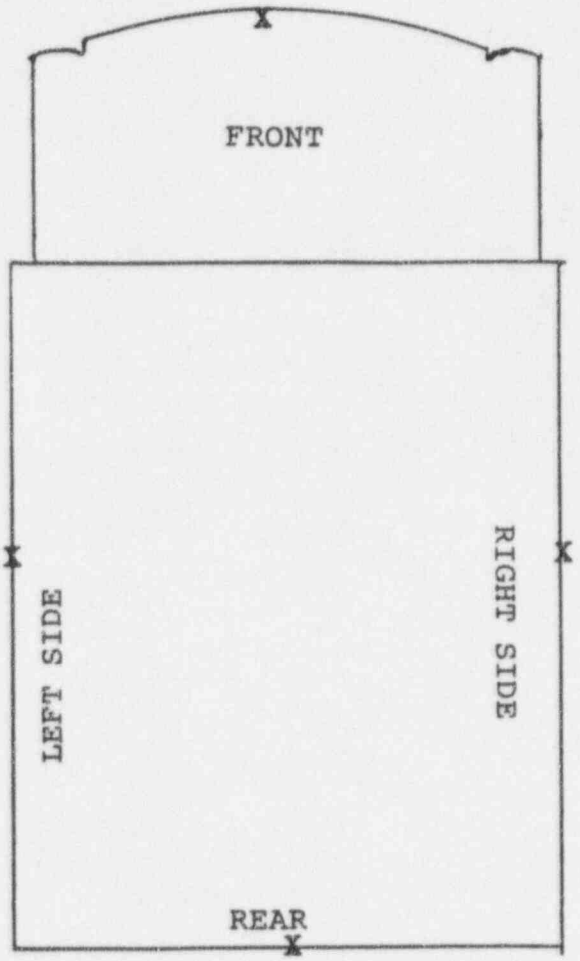
DATE _____

SURVEY METER IDENTIFICATION:

MANUFACTURER _____ SERIAL NO. _____

MODEL NO. _____

ALL READINGS IN MR/HOUR



SURVEY

FRONT _____ MR/HR

REAR _____ MR/HR

R SIDE _____ MR/HR

L SIDE _____ MR/HR

X- DENOTES POSTING WITH RADIOACTIVE SIGNS

_____

OPERATOR

PERFORATING SERVICES, INC.

Area Monitoring Form

All radioactive materials storage bunkers and downhole storage facilities are to be monitored for radiation levels each month. This check should be made at the same time that inventory is made.

Type Survey Meter Used _____ Date _____

Meter Serial No. _____ Location _____

Date Calibrated _____

1. Background _____ mr/hr*

2. Radiation level at surface of bunker door (measure each door separately – no measurement is needed if bunker is empty – indicate if empty)

   No. 1 _____ mr/hr

   No. 2 _____ mr/hr

   No. 3 _____ mr/hr

3. Radiation level at 1 meter from bunker door

   No. 1 _____ mr/hr

   No. 2 _____ mr/hr

   No. 3 _____ mr/hr

4. Background _____ mr/hr*

5. Highest radiation level at surface of downhole storage (on cover) _____ mr/hr

_____
Signature

Make out Form in duplicate. Retain one copy at location and forward second copy to Charles Franklin P.O. Box 912 Casper, WY 82601

*Normal background is recorded at least 30 feet from the storage bunker or 6 feet from the cover of the downhole storage.

Monitor each truck with maximum load of radioactive material in place. Retain copies of this at location. After this is done, each truck is to be monitored monthly with all radioactive material removed.

Truck No.	Back Sign	Front Sign	Left Sign	Right Sign

1.19

NS-287 12-78

SUMMARY OF RADIOACTIVE MATERIAL USE

Region __________ District __________ RSO ________________

RECEIVED			USAGE OR DISPOSAL				
Date	Amount (C-MC-MG)	Material (Type)	Date	Amt. Material (Type)	Use Well,Co.	Transfer Reg./Dist.	Disposition Reg./Dist.

Maintain Running Inventory
Insert Original Received Date

Use This Column For Any
Necessary Remarks