

## 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

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 \_\_\_\_\_  
☐ C. RENEWAL OF LICENSE NUMBER \_\_\_\_\_

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

Perforating Guns Inc.  
503 So. Mississinni St.  
Nowata Okla. 74048  
(918) 273-2159

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

Perforating Guns Inc. Also temporary job sites in Oklahoma  
400 E. Cherokee St.  
Nowata Okla.  
74048

**4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION**

Dwight Knoblett Pres. Perforating Guns Inc. Nowata, Okl. 74048  
503 So. Miss. St. (918) 273-2817

**TELEPHONE NUMBER**

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 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 \$

**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

Dwight Knoblett

President

10/9/85

**14. VOLUNTARY ECONOMIC DATA**

**a. ANNUAL RECEIPTS**

☒ <\$250K  
☐ \$250K-500K  
☐ \$500K-750K  
☐ \$750K-1M

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

2

**c. NUMBER OF BEDS**

0

**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)**

☐ YES

☒ NO

**FOR NRC USE ONLY**

TYPE OF FEE

FEE LOG

FEE CATEGORY

COMMENTS

APPROVED BY

AMOUNT RE

8512030183 851021  
REG4 LIC30  
35-23200-01 PDR

DATE

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ITEM 5

A. ELEMENT AND MASS NUMBER

1. AMERICIUM 241

B. CHEMICAL OR PHYSICAL FORM MAKE AND MODEL NUMBER IF  
SEALED SOURCE.

2. SEALED SOURCE GN-71-1 GAMMA IND. NB-HP

C. MAXIMUM NUMBER OF MILLICURIES TO BE POSSESSED.

3. 1 SOURCE NOT TO EXCEED 3 CURIES

ITEM 6

SEALED SOURCE FOR NEUTRON WELL LOGGING ON OIL AND GAS WELLS.

ITEM 7

DWIGHT KNOBLETT WILL BE RADIATION PROTECTION OFFICER  
STARTED WORK IN 1957 FOR BIRDWELL SURVEYS USING RADIUM-BERYLLIUM  
AND PLUTONIUM-BERYLLIUM SOURCES. WORKED 2 YRS. FOR BIRDWELL  
UNTIL 1959. 1960-1961 WORKED FOR GEARHART USING AM-BE SOURCES.  
1961- 1978 WORKED FOR GOLD PERFORATING CO. USING AM-BE SOURCES.  
1978- 1985 WORKED FOR WELL LOGGING INC. AGAIN USING AM-BE SOURCES  
MAKING A TOTAL OF 28 YRS. EXPERIENCE LOGGING USING SOURCES.

STEVE KNOBLETT WILL RADIATION OFFICER.  
STARTED WORKING FOR GOLD PERFORATING CO. IN 1973- 1978 USING  
AM-BE SOURCES. 1978- 1985 WORKED FOR WELL LOGGING INC. USING AM-BE  
SOURCES. HAS 12 YRS. EXPERIENCE USING SEALED SOURCES.

RADIATION PROGRAM MANAGEMENT AND RESPONSIBILITIES.

A. RADIATION PROTECTION OFFICER

1. THE RADIATION PROTECTION OFFICER IS TO BE DESIGNATED  
OVERALL MANAGER FOR THE RADIATION PROGRAM.
2. 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: DWIGHT KNOBLETT.

B. RADIATION SAFETY OFFICER

1. 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 COMPLIANCE
  - C. VEHICLE SURVEY RECORDS
  - D. TRAINING AND QUALIFYING PERSONNEL
  - E. CONDUCTS PERIODIC SAFETY CHECKS TO ASSURE THE  
RADIATION PROTECTION PROGRAM. THE RADIATION SAFETY  
OFFICER IS: STEVE KNOBLETT.

ITEM 8

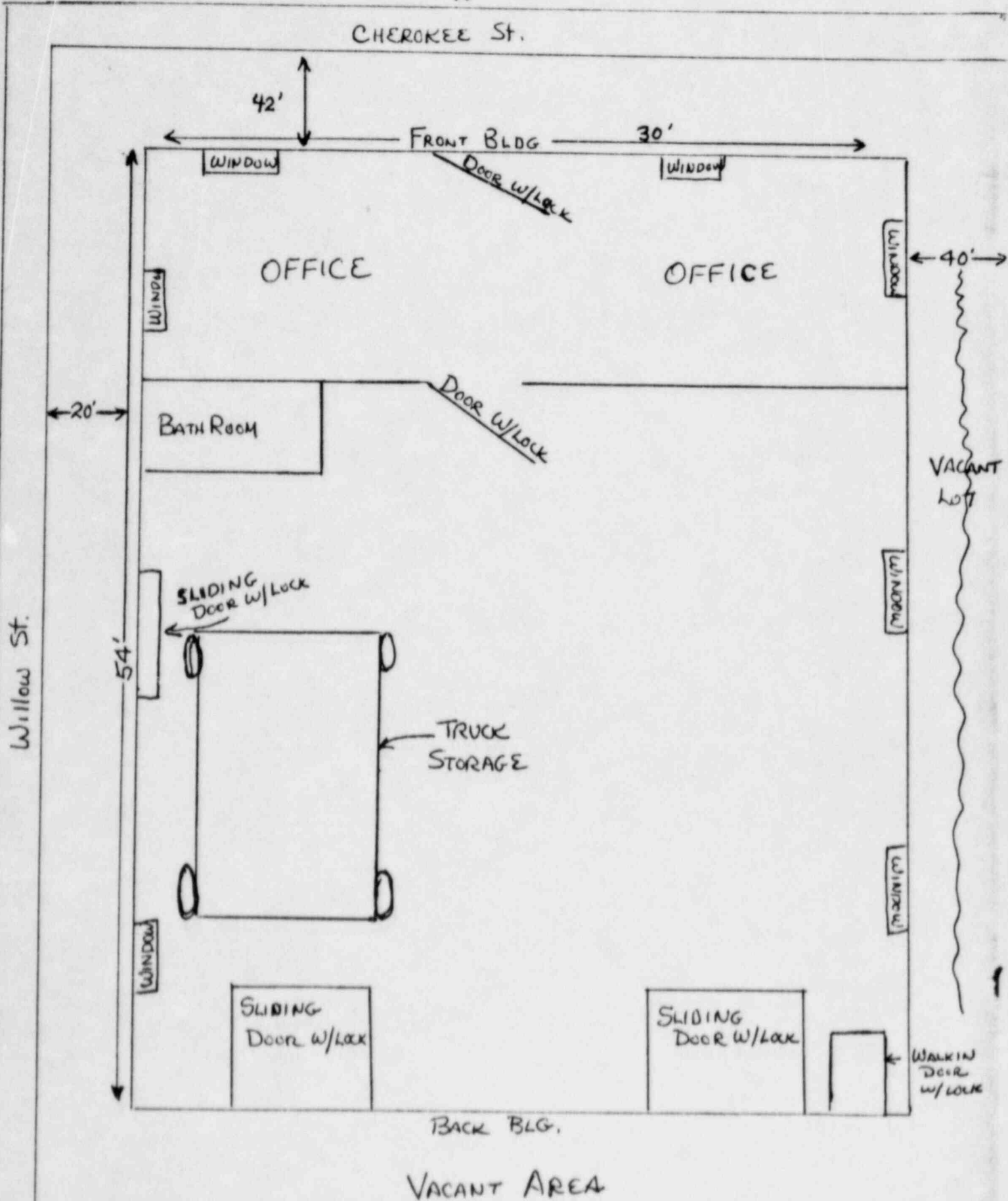
TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED  
AREAS.

THERE ARE ONLY TWO EMPLOYEES IN THE COMPANY. DWIGHT KNOBLETT  
AND STEVE KNOBLETT. NEITHER OF WHICH HAVE HAD ANY FORMAL  
TRAINING IN RADIATION CLASSES. BUT BOTH OF US HAVE MANY YEARS  
HANDLING SEALED SOURCES.

1. DWIGHT KNOBLETT 28 YEARS EXPERIENCE.
2. STEVE KNOBLETT 12 YEARS EXPERIENCE.

ITEM 8

3. ANY NEW EMPLOYEES OF PERFORATING GUNS INC. MAY HIRE IN THE FUTURE WILL BE REQUIRED TO ATTEND A SCHOOL ON RADIATION AND BE CERTIFIED. THEN FOLLOWED BY THREE MONTHS ON THE JOB TRAINING UNDER THE DIRECT SUPERVISION OF ONE OF THE AUTHORIZED PERSONNEL.
4. INSTRUCT ANY NEW PERSONNEL: READ O&E MANUAL CAREFULLY. INSTRUCT THE NEW EMPLOYEES NOT TO GO INTO RESTRICTED AREA WITHOUT SUPERVISION. ALWAYS WEAR FILM BADGES WHEN BEING EXPOSED TO RADIATION IN ANY MANNER.





FACILITIES AND EQUIPMENT

- A. SKETCH OF SHOP AND STORAGE AREA FOR TRUCK. PAGE 3
- B. THE SOURCE WILL BE LOCKED IN THE SOURCE CONTAINER.  
THE CONTAINER WILL BE CHAINED AND LOCKED TO THE TRUCK  
AT ALL TIMES.
- C. SKETCHES OF RADIOACTIVE HANDLING EQUIPMENT.
  1. STORAGE ASSEMBLY
  2. SOURCE LOADING TOOL
  3. SOURCE HOLDER FOR 3 CURIE SOURCE

ITEM 10

A. RADIATION SAFETY PROGRAM

1. UTILIZATION LOG

THIS LOG WILL CONTAIN THE MASTER FILE ON TYPE OR SHIPMENT OF RADIOACTIVE MATERIALS RECEIVED AND DISTRIBUTION OF EACH SHIPMENT. THIS MASTER FILE WILL BE MAINTAINED AT THE FACILITY. SOME OF THE RECORDS CONTAINED IN THE FILE ARE:

- A. COPY OF THE PURCHASE, LISTING THE TYPE AND STRENGTH OF THE MATERIALS.
- B. PACKING SLIP AND RECEIPT OF DELIVERY.
- C. LOG SHEETS OF WHAT TIME THE MATERIALS ARE REMOVED AND RETURNED TO THE PERMANENT STORAGE AS WELL AS THE LOCATION WHERE THE SOURCE WAS USED.
- D. LEAK TEST REPORTS
- E. EMERGENCY PROCEDURES REPORTS
- F. RECORDS OF DISPOSAL
- G. RECEIPT FOR SHIPMENT WHEN THE SOURCE IS DISPOSED OF.

2. SURVEY FILE

- A. A SURVEY FILE WILL BE MAINTAINED AND CONTAIN THE FOLLOWING:
  1. INSTRUMENT CALIBRATION REPORTS AND CERTIFICATE
  2. MONTHLY SURVEY OF STORAGE BUILDINGS AND VEHICLES
  3. RADIOACTIVE MONITORING FORM SAMPLE ATTACHED

3. PERSONNEL MONITORING PROCEDURES AND FILE

- A. ALL PERSONNEL DIRECTLY RELATED TO THE ACTIVITY INVOLVING RADIOACTIVE MATERIALS WILL WEAR A FILM BADGE TO MONITOR GAMMA, NEUTRON AND BETA EXPOSURE. FILM BADGES FROM ATOMIC ENERGY INDUSTRIAL LABORATORIES 6421 SO. MAIN ST. HOUSTON TEXAS 77030 WILL BE USED AND MAILED IN EACH MONTH FOR EVALUATION.
- B. FILM BADGE RECORDS WILL BE POSTED MONTHLY
- C. ALL PERSONNEL INDIRECTLY RELATED TO THE ACTIVITY INVOLVING RADIOACTIVE MATERIAL, YET MAY COME INTO CONTACT WITH AN EXPOSURE LEVEL OF 2 MR/HR OR GREATER, WILL BE REQUIRED TO WEAR A BADGE AND A RECORD OF THE EXPOSURE WILL BE LOGGED.
- D. ALSO FILED FOR EACH EMPLOYEE WILL BE PREVIOUS LEVELS FROM PAST EMPLOYERS.

B. RADIATION PROTECTION INSTRUMENTS AND CALIBRATION

1. SURVEY INSTRUMENTS WILL BE USED EACH TIME A SOURCE IS HANDLED OR TRANSPORTED.
2. SURVEY INSTRUMENTS WE WILL BE USING ARE LUDLUM MODEL 2 LOW RANGE BETAGAMMA AND WILL BE CALIBRATED EVERY 6 MONTHS BY LUDLUM MEASUREMENTS INC. SWEETWATER TEXAS.
3. RECORDS OF THE CALIBRATION WILL BE MAINTAINED IN THE SURVEY FILE AND A COPY OF THE RECORD WITH THE INSTRUMENT.

C. LEAK TESTS

1. ALL SEALED SOURCES WILL BE LEAK TESTED AT AN INTERVAL NOT TO EXCEED 6 MONTHS.
2. WE WILL BE USING A LEAK TESTING KIT FURNISHED BY ATOMIC ENERGY INDUSTRIAL LABORATORIES 6421 SO. MAIN ST. HOUSTON, TEXAS 77030 (790-9719)
3. A SOURCE IS NOT TO BE USED WITHOUT PROOF THAT IT HAS BEEN LEAK TESTED WITHIN THE LAST 6 MONTHS.
4. A COPY OF THE LEAK TEST WILL BE KEPT ON FILE AT ALL TIMES

D. MONTHLY SURVEY OF THE STORAGE BUILDING AND VEHICLES

1. SURVEYS OF THE STORAGE AREA WILL BE MAINTAINED ON A MONTHLY BASIS AND FILED IN THE SURVEY FILE. THESE SURVEYS WILL REFLECT IN MILLIROENTGENS, READING AT A POINT ON EACH SIDE AND TOP OF STORAGE AREA.
2. VEHICLE SURVEYS WILL BE CONDUCTED AT MONTHLY INTERVALS AND THESE SURVEYS WILL BE MAINTAINED IN THE SURVEY FILE, AND ALSO, A COPY WILL BE ATTACHED TO THE JOB SHEET.

E. STORAGE FACILITIES AND PROCEDURES.

1. VEHICLE STORAGE

THE SOURCE CONTAINERS LOCATED IN THE REAR OF THE VEHICLE, CHAINED AND LOCKED IN PLACE AND WILL REMAIN LOCKED AT ALL TIMES EXCEPT WHEN HANDLING MATERIALS.

2. POSTING RESTRICTED AREAS. VEHICLES AND LABELLING CONTAINERS

- A. POSTING RESTRICTED AREAS AND STORAGE AREA WHERE THE LEVELS ARE EXPECTED TO ACHIEVE 2 MR PER HOUR WILL BE LABELLED WITH SIGNS STATING " CAUTION RADIOACTIVE MATERIAL." THESE SIGNS WILL BEAR THE RADIATION SYMBOL AND BE MAGENTA AND SAFETY YELLOW IN COLOR. THE SIGNS WILL BE CONSPICIOUS FROM ALL DIRECTIONS.
- B. VEHICLE PLACARDING, ALL VEHICLES TRANSPORTING OR CONTAINING RADIOACTIVE MATERIALS WILL BEAR A PLACARD ON FOUR SIDES THAT BEARS THE PROPER LABELLING ACCORDING TO D.O.T. SPECIFICATIONS OF THE WORD "RADIOACTIVE." THE PLACARD IS APPROX. 11 INCHES X 11 INCHES SQUARE IN SIZE.
- C. ALL CONTAINERS CARRYING OR STORING OR USED FOR TRANSPORTING RADIOACTIVE MATERIALS WILL BEAR A TAG WITH THE IDENTIFICATION OF THE RADIOACTIVE MATERIAL, THE QUANTITY OF THE RADIOACTIVE MATERIAL AND THE DATE THAT THE RADIOACTIVE MATERIAL WAS THAT PARTICULAR QUANTITY. THE TAG WILL ALSO STATE "CAUTION-RADIOACTIVE MATERIAL".

3. PROCEDURES FOR TRANSPORTING RADIOACTIVE MATERIALS

- A. RADIOACTIVE MATERIALS MAY BE TRANSPORTED BY COMPANY VEHICLE OR PRIVATE VEHICLES PROVIDED THE VEHICLE OR PRIVATE VEHICLES PROVIDED THE VEHICLE 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 PROPERLY PLACARDED.
- C. IT IS CLEARLY UNDERSTOOD THAT THE SIGNS WILL BE REMOVED FROM THE VEHICLE WHEN NOT TRANSPORTING RADIOACTIVE MATERIAL.

4. CONTROLLING ACCESS TO RESTRICTED AREAS.

- A. RESTRICTED AREAS, WHENEVER POSSIBLE, WILL BE LOCKED AGAINST UNAUTHORIZED ENTRY.
- B. WHEN A SOURCE IS BEING USED ON A WELLSITE ALL UNQUALIFIED PERSONNEL WILL BE ASKED TO LEAVE TO A SAFE DISTANCE.

F. TRAINING OF PERSONNEL

- A. ALL NEW PERSONNEL WILL BE REQUIRED TO ATTEND A QUALIFIED RADIOACTIVE SCHOOL. OR BE CLOSELY SUPERVISED BY ONE OF THE QUALIFIED SUPERVISORS.

ITEM 11

WASTE MANAGEMENT

- 1. WE WILL NOT GENERATE ANY RADIOACTIVE WASTE MATERIAL.
- 2. WHEN WE'RE FINISHED WITH THE SEALED SOURCE AND WISH TO DISPOSE OF IT WE WILL RETURN IT TO THE MANUFACTURER OR TRANSFER IT TO ANOTHER LICENCED COMPANY.



PERFORATING GUNS INC.

OPERATING INSTRUCTIONS

AND

EMERGENCY PROCEDURES

MANUAL

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# A. HANDLING AND 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 WHO MAY BE ASSOCIATED AT ALL TIMES. THE ABOVE PERSONNEL ( COMPANY) MUST PERSONNALLY 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 PERSONNELSHALL BE REQUIRED TO BE REMOTE TO THESE OPERATIONS.
2. DURING EACH WELL-LOGGING APPLICATION THE OPERATIONS SUPERVISOR OR DESIGNATED EMPLOYEE SHOULD MAINTAIN DIRECT SURVEILLANCE OF THE OPERATIONS TO PROTECT AGAINST AN UNAUTHORIZED OR UNNESSARY ENTRY INTO A RESTRICTED AREA.
3. ONLY THE COMPANY APPROVED HANDLING TOOLS WILL BE USED.
4. ALL SOURCES ARE TO BE TRANSPORTED IN THE APPROVED AND LOCKED SOURCE SHIPPING CONTAINERS.
5. OUR STANDARD NEUTRON LOGGING SOURCE ASSEMBLY ENCLOSES A 3.0 CURIE AMERICIUM-241 BERYLLIUM NEUTRON SOURCE. A DOSE RATE OF APPROXIMATELY 48-54 MR/HR(NEUTRON AND GAMMA) PRESENT AT ONE METER FROM THE UNSHIELDED SOURCE. THE DOSE RATE OF A 5CURIE SOURCE IS 80-90 MR/HR (NEUTRON AND GAMMA) PRESENT AT ONE METER FROM THE UNSHIELDED SOURCE.
6. 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 THE WELL WHEN LOGGING OPERATION IS FINISHED THE DRILLER 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.
7. 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 SHEET.
8. ARRIVAL AT WELL SITE USING LOW LEVEL SURVEY METER, MONITOR THE AREA BEFORE COMMENCING JOB. RECORD ON SKETCH OF AREA. AFTER ARRIVING JOB IS FINISHED RE-MONITOR 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.

B. RADIATION SURVEYS

1. IN GENERAL A SURVEY SHOULD BE TAKEN EACH TIME A SOURCE IS MANIPULATED OR MOVED. AN APPROVED PORTABLE LOW LEVEL SURVEY METER SHOULD BE USED FOR THE SURVEYS AND RECORDS KEPT.
2. A SURVEY OF THE STORAGE AREA WILL BE MAINTAINED ON A MONTHLY BASIS AND FILED IN THE SURVEY FILE. THESE READINGS WILL REFLECT IN MILLIROCENTGENS, READING AT A POINT ON EACH SIDE AND TOP OF STORAGE AREA.
3. VEHICLE SURVEYS WILL BE CONDUCTED AT MONTHLY INTERVALS AND THESE SURVEYS WILL BE MAINTAINED IN THE SURVEY FILE, AND ALSO, A COPY WILL BE ATTACHED TO THE JOB SHEET.

C. ACCESS CONTROL PROCEDURES

1. ALL CONTAINERS CARRYING OR STORING OR USED FOR TRANSPORTING RADIOACTIVE MATERIALS WILL BEAR A TAG WITH THE IDENTIFICATION OF THE RADIOACTIVE MATERIAL, THE QUANTITY OF THE RADIOACTIVE MATERIAL, AND THE DATE THAT THE RADIOACTIVE MATERIAL WAS THAT PARTICULAR QUANTITY. THE TAG WILL ALSO STATE: "CAUTION RADIOACTIVE MATERIAL."
2. THE TRUCK WILL BE LABELED AND OPERATED ACCORDING TO THE PROCEDURES SPECIFIED IN PART F BELOW.
3. FOR LOGGING OPERATIONS PERFORMED AT WELL SITES. LOGGING PERSONNEL WILL, AT ALL TIMES DURING THE OPERATION, MAINTAIN SURVEILLANCE OF THE AREA AND PREVENT UNAUTHORIZED PERSONNEL FROM ENTERING THAT AREA AT ANY TIME THE SOURCE HOLDER IS NOT SECURED IN THE STORAGE ASSEMBLY.

D. STORING AND SECURING RADIOACTIVE MATERIALS

1. AS DESCRIBED IN PART A ABOVE. THE STORAGE CONTAINER WILL REMAIN LOCKED OR WITHIN THE IMMEDIATE LINE OF SIGHT OF LOGGING PERSONNEL WHENEVER THE SOURCE HOLDER IS PLACED THEREIN.
2. SURVEYS AS REQUIRED IN PART B ABOVE WILL BE CONDUCTED OF THE SOURCE STORAGE ASSEMBLY, THE FIELD OFFICE STORAGE FACILITY, AND THE TRUCK.
3. THE "RADIOACTIVE" PLACARDS DESCRIBED IN PART F BELOW



WILL BE PLACED ON THE TRUCK WHENEVER THE STORAGE ASSEMBLY IS PLACED THEREIN.

4. THE FIELD OFFICE STORAGE FACILITY WILL BE SECURELY LOCKED WHEN THE SOURCE STORAGE ASSEMBLY IS PLACED THEREIN. SIGNS READING " CAUTION RADIOACTIVE MATERIAL " WILL BE PLACED IN A AND OBVIOUS LOCATIONS AROUND THE STORAGE FACILITY. THESE SIGNS WILL BEAR THE RADIATION SYMBOL AND WILL BE MAGENTA AND SAFETY YELLOW IN COLOR.

E. PERSONNEL MONITORING PROCEDURES

1. ALL PERSONNEL DIRECTLY RELATED TO ACTIVITY INVOLVING RADIOACTIVE MATERIALS WILL WEAR A FILM BADGE TO MONITOR GAMMA NEUTRON AND BETA RADIATION. FILM BADGE RECORDS WILL BE KEPT QUARTERLY AND MONITORING WILL BE DONE ON A MONTHLY BASIS.
2. IT IS CLEARLY UNDERSTOOD THAT MAXIMUM ACCEPTABLE DOSE LEVELS ARE NOT TO EXCEED 1.25 REM PER CALENDER QUARTER OR NO MORE THAN 5.0 REM PER CALENDER YEAR.
3. 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 A QUARTERLY BASIS.

F. PROCEDURES FOR TRANSPORTING RADIOACTIVE SOURCES

1. UPON REMOVAL OF THE STORAGE ASSEMBLY FROM THE FIELD OFFICE STORAGE FACILITY, THE STORAGE ASSEMBLY SHALL BE PLACED ON THE TRUCK AND SECURED IN ITS DESIGNATED POSITION. IT SHOULD BE SUFFICIENTLY SECURED TO PREVENT SHIFTING OF THE STORAGE ASSEMBLY IN TRANSIT.
2. SURVEYS AS DESCRIBED IN PART B ABOVE SHOULD BE TAKEN AND THE RESULTS RECORDED AT THE PROPER STAGES OF THE WELL LOGGING OPERATIONS.
3. THE TRUCK SHALL BEAR A PLACARD ON FOUR SIDES WHICH BEARS THE WORD "RADIOACTIVE." THIS SIGN SHALL BE APPROXIMATELY 6" X 30" AND WILL BE PLACED ON THE TRUCK ONLY WHEN IT IS TRANSPORTING OR STORING THE RADIOACTIVE MATERIALS. THE SIGN SHALL HAVE BLACK LETTERING ON A SAFETY YELLOW BACKGROUND.

G. RECORDS MANAGEMENT

1. UTILIZATION LOG--THIS LOG WILL CONTAIN THE MASTER FILE ON EACH TYPE OR SHIPMENT OF RADIOACTIVE MATERIAL RECEIVED AND THE DISTRIBUTION OF EACH SUCH SHIPMENT. IT WILL BE MAINTAINED AT THE FACILITY. ALSO IT WILL CONTAIN ON EACH SOURCE THE INFORMATION LISTED BELOW
  - A. MAKE, MODEL NUMBER, AND A SERIAL NUMBER OR A DESCRIPTION OF EACH SOURCE OF RADIATION USED.
  - B. THE IDENTITY OF THE WELL-LOGGING SUPERVISOR OR FIELD UNIT TO WHOM ASSIGNED.
  - C. LOCATIONS AND DATES OF USE.

## H. LEAK TEST PROCEDURES

1. WIPE TESTS ON ALL SOURCES MUST BE PERFORMED AT INTERVALS NOT EXCEEDING SIX MONTHS.
2. SOURCE WILL BE WIPE TESTED WITH A LEAK TEST KIT FROM ATOMIC ENERGY INDUSTRIAL LABORATORIES. 6421 SO. MAIN ST., HOUSTON TEXAS. 77030 (790-9719)
3. LEAK TESTS WILL BE MAILED TO ATOMIC ENERGY INDUSTRIAL LABORATORIES FOR COUNTING.
4. REPORTS WILL BE SENT BACK TO LICENSEE WITH LEAK TEST CERTIFICATE RESULTS BEING KEPT ON FILE.

## I. EMERGENCY PROCEDURES

1. 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 THIS OUTLINE.
2. VEHICLE WRECK  
  
IN THE EVENT OF AN ACCIDENT WHILE TRANSPORTING RADIOACTIVE MATERS. 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 PROTECTION OFFICER TO NOTIFY THE PROPER GOVERNMENTAL AGENCY
3. DIRECTOR, NRC REGIONAL OFFICE (REGION IV)  
OFFICE OF INSPECTION AND ENFORCEMENT  
611 RYAN PLAZA DRIVE  
SUITE 1000  
ARLINGTON, TEXAS 76012  
TELEPHONE: 817--334-3841
4. OKLAHOMA  
DIRECTOR, OKLAHOMA DEPARTMENT OF ENERGY  
4400 N. LINCOLN BLVD.  
OKLAHOMA CITY, OKLA. 73105  
405 / 521-2995

5. PROCEDURE FOR LOST SOURCE DOWNHOLE

- A. 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 THE WELL OPERATOR A DRAWING OF THE SOURCE AND THE LOGGING TOOL. THIS WILL ENABLE HIM TO KNOW BEFORE HE STARTS THE FISHING OPERATION THE QUANTITY, TYPE OF RADIOACTIVE MATERIAL, AND THE MECHANICAL CONSTRUCTION OF THE SOURCE AND THE LOGGING TOOL INVOLVED.
- B. IMMEDIATELY NOTIFY THE PERSONS LISTED ABOVE AND KEEP THEM INFORMED OF THE PROGRESS TOWARD RECOVERY OF THE SOURCE.
- C. PERSONNEL MONITORING EQUIPMENT SHOULD BE DISTRIBUTED TO THE RIG PERSONNEL AND COMPANY PERSONNEL. THE WELL OPERATOR SHOULD BE ADVISED THAT THESE ARE FOR THEIR PROTECTION AND ARE INTENDED PRIMARILY FOR A RECORD OF THE OPERATION.
- D. DURING THE FISHING OPERATION, THE MUD BEING CIRCULATED SHOULD BE MONITORED USING SURVEY EQUIPMENT CAPABLE OF MEASURING GAMMA RAY RADIATION.
- E. IT IS NECESSARY TO MINIMIZE POSSIBLE EXPOSURES BY CONTROLLING THE TIME AND DISTANCE FACTORS DURING THE FISHING OPERATION. WHERE PRACTICAL, EVERYONE, EXCEPT THE WELL OPERATOR AND ENOUGH PERSONNEL TO PROVIDE NECESSARY ASSISTANCE DURING THE OPERATION, SHOULD BE KEPT FROM THE AREA. ALL HANDLING OF THE DRILLING RIG EQUIPMENT SHOULD BE HANDLED BY THE WELL OPERATOR AND ACTUAL HANDLING OF THE SOURCE SHOULD BE DONE BY THE RADIATION SAFETY OFFICER OR A QUALIFIED DESIGNEE.
- F. IN THE EVENT THE SOURCE CANNOT BE RECOVERED FROM THE WELL, THE RADIATION SAFETY OFFICER SHOULD SO INFORM THE APPROPRIATE PERSONS LISTED ABOVE, AND THE WELL OWNER OR HIS REPRESENTATIVE. THE RADIATION SAFETY OFFICER WILL MAKE SURE THAT ARRANGEMENTS FOR PERMANENTLY SEALING THE HOLE ARE MADE, AND THE HOLE IS THEN SEALED. HE WILL BE RESPONSIBLE FOR ENSURING THAT ANY SPECIFIC INSTRUCTIONS FROM NRC OR THE APPROPRIATE STATE AGENCY ARE FOLLOWED. HE WILL SEE TO IT THAT THE HOLE IS MARKED WITH PERMANENT SIGNS WHICH INDICATE THE SOURCE IS SEALED IN THE WELL HOLE.

6. FIRES

- A. NOTIFY ALL PERSONNEL IN THE AREA IMMEDIATELY
- B. ATTEMPT TO PUT OUT ALL FIRES IF A RADIATION
- C. NOTIFY THE FIRE DEPARTMENT
- D. NOTIFY THE RADIATION PROTECTION OFFICER
- E. THE RADIATION PROTECTION OFFICER WILL 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 PROTECTION 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

7. LEAKING SOURCE

- A. IF A SOURCE IS LEAKING WHICH THE LOGGING TOOL WOULD INDICATE, SHUT THE OPERATIONS DOWN
- B. NOTIFY CONTRACTOR AND IMMEDIATELY CALL RADIATION SAFETY OFFICER FOR INSTRUCTIONS
- C. SET UP CONTROL PROCEDURES FOR KEEPING PERSONNEL OUT OF THE IMMEDIATE AREA UNTIL INSTRUCTIONS ARE RECEIVED FROM THE RADIATION SAFETY OFFICER



J.. REVIEW OF RADIATION SAFETY PROGRAM

THE RADIATION PROTECTION OFFICER WILL CONDUCT QUARTERLY REVIEWS OF THE RADIATION SAFETY PROGRAM. THESE REVIEWS WILL INCLUDE:

1. DETERMINING THAT THESE ESTABLISHED PROCEDURES ARE BEING FOLLOWED TO ENSURE THE PROTECTION OF THE HEALTH AND SAFETY OF PERSONNEL AND THE GENERAL PUBLIC.
2. CHECK TO SEE THAT ALL REQUIRED RECORDS ARE BEING MAINTAINED. INCLUDING THOSE RECORDS DESCRIBED IN PART G ABOVE.
3. DETERMINING THAT ALL EQUIPMENT ASSOCIATED WITH THE WELL LOGGING OPERATION IS IN SAFE WORKING ORDER.

K. INSPECTION OF SOURCE HOLDERS. STORAGE CONTAINERS AND TRANSPORT CONTAINERS

INSPECTION OF SOURCE HOLDERS. STORAGE CONTAINERS AND TRANSPORT CONTAINERS WILL BE INSPECTED EVERY SIX MONTHS. IN THE EVENT THAT SOMETHING IS WRONG WITH ANY OF THE ABOVE ITEMS. NOTIFY SAFETY OFFICER IMMEDIATELY.

L. NOTIFICATIONS OF INCIDENTS

A. EACH LICENSEE SHALL IMMEDIATELY NOTIFY BY TELEPHONE THE NRC REGIONAL OFFICE IN ARLINGING, TEXAS . PHONE NO. 817/334-3841. ANY INCIDENT INVOLVING A SOURCE THAT MAY CAUSE OR THREATEN TO CAUSE:

1. EXPOSURE OF THE WHOLE BODY OF INDIVIDUAL TO 25 REMS OR MORE OF RADIATION; EXPOSURE OF THE SKIN OF THE WHOLE BODY OF ANY INDIVIDUAL 150 REMS OR MORE OF RADIATION; OR EXPOSURE OF THE FEET. ANKLES. HANDS OR FOREARMS OF ANY INDIVIDUAL TO 375 REMS OR MORE OF RADIATION.
2. THE RELEASE OF RADIOACTIVE MATERIAL IN CONCENTRATIONS WHICH IF AVERAGED OVER A PERIOD OF 24 HOURS. WOULD EXCEED 5,000 THE LIMITS SPECIFIED FOR SUCH MATERIALS.
3. A LOSS OF ONE WORKING WEEK OR MORE OF THE OPERATION OF ANY FACILITIES AFFECTED.
4. DAMAGE TO PROPERTY IN EXCESS OF \$200,000.

B. TWENTY-FOUR HOUR NOTIFICATION. EACH LICENSEE SHALL WITHIN 24 HOURS NOTIFY BY TELEPHONE THE REGIONAL NRC OFFICE IN ARLINGTON. TEXAS. PHONE NO. 817/334-3841

1. EXPOSURE OF THE WHOLE BODY OF ANY INDIVIDUAL TO 5 REMS OR MORE OF RADIATION. EXPOSURE OF THE SKIN OF THE WHOLE BODY OF ANY INDIVIDUAL TO 30 REMS OR MORE OF RADIATION:OR EXPOSURE OF THE FEET. ANKLES. HANDS OR FOREARMS TO 75 REMS OR MORE OF RADIATION.
  2. THE RELEASE OF RADIOACTIVE MATERIAL IN CONCENTRATIONS WHICH IF AVERAGED OVER A PERIOD OF 24 HOURS WOULD EXCEED 500 TIMES THE LIMITS SPECIFIED FOR SUCH MATERIALS.
  3. LOSS OF ONE DAY OR MORE OF THE OPERATION OF ANY FACILITIES AFFECTED.
  4. DAMAGE TO PROPERTY IN EXCEES OF \$2000.
- C. ANY REPORT FILED WITH THE COMMISSION SHALL BE PREPARED SO THAT NAMES OF INDIVIDUALS WHO HAVE RECEIVED EXPOSURE TO RADIATION BE STATED IN SEPARATE PART OF THE REPORT.
- D. A. IN ADDITION TO THE REPORTS ABOVE. EACH LICENSEE SHALL MAKE A REPORT IN WRITING WITHIN 30 DAYS TO THE REGIONAL NRC OFFICE WITH A COPY SENT TO: DIRECTOR OF INSPECTION AND ENFORCEMENT. U.S. NUCLEAR REGULATORY COMMISSION. WASHINGTON. D.C. 20555
- B. REPORTS TO COMMISSION ARE TO CONTAIN INDIVIDUALS'S NAME. SOCIAL SECURITY NUMBER. DATE OF BIRTH AND ESTIMATE OF EXPOSURE.
- M. WELL-LOGGING OPERATIONS USING SEALED SOURCES.
- A. A LICENSEE MAY PERFORM WELL-LOGGING OPERATIONS WITH A SEALED SOURCE ONLY AFTER THE LICENSEE EXECUTES A WRITTEN AGREEMENT WITH WELL OWNER OR OPERATOR THAT WITHIN 30 DAYS AFTER A SOURCE HAS BEEN CLASSIFIED AS IRRETRIEVABLE. THE FOLLOWING REQUIREMENTS WILL BE IMPLEMENTED.
- B. LOSS OF SOURCE: NOTIFY NRC OFFICE IN ARLINGTON \*. TEXAS PHONE NO. 817/334-3841.
- C. NOTIFY STATE CORPORATION COMMISSION.
1. EACH IRRETRIEVABLE SOURCE MUST BE IMMOBILIZED AND SEALED IN PLACE WITH A CEMENT PLUG.
  2. NO MORE DRILLING ON WELL WITHOUT WHIPSTOCK OR DEFLECTION DEVICE USED ABOVE SOURCE.
  3. A PERMANENT PLAQUE CONSTUUCTED OF LONG LASTING MATERIAL SHOULD BE PLACED ON WELL. WITH THE FOLLOWING INFORMATION:

A. WORD CAUTION

- B. RADIATION SYMBOL
  - C. DATE SOURCE ABANDONED
  - D. NAME OF WELL OWNER
  - E. WELL NAME AND WELL IDENTIFICATION NUMBER
  - F. TYPE SOURCE AND STRENGTH
  - G. DEPTH SOURCE AND DEPTH TO TOP OF CEMENT PLUG
- D. NOTIFY NRC REGIONAL FIELD OFFICE WITHIN 30 DAYS IN WRITING.
- E. NOTIFY STATE CORPORATION COMMISSION.
- N. PROCEDURES FOR PICKING UP, RECEIVING, AND OPENING PACKAGES
- A. EACH LICENSEE WHO EXPECTS TO RECEIVE A PACKAGE CONTAINING QUANTITIES OF RADIOACTIVE MATERIAL IN EXCESS OF THE TYPE A QUANTITIES SPECIFIED IN PARAGRAPH B OF THIS SECTION SHALL:
- 1. IF THE PACKAGE IS TO BE DELIVERED TO THE THE LICENSEE'S FACILITY BY THE CARRIER, MAKE ARRANGEMENTS TO RECEIVE THE PACKAGE WHEN IT IS OFFERED FOR DELIVERY BY THE CARRIER;
  - 2. IF THE PACKAGE IS TO BE PICKED UP BY THE LICENSEE AT THE CARRIER'S TERMINAL, MAKE ARRANGEMENTS TO RECEIVE NOTIFICATION FROM THE CARRIER OF THE ARRIVAL OF THE PACKAGE. AT THE TIME OF ARRIVAL.
  - 3. EACH LICENSEE WHO PICKS UP A PACKAGE OF RADIOACTIVE MATERIAL FROM A CARRIER'S TERMINAL SHALL PICK UP THE PACKAGE EXPEDITIOUSLY UPON RECEIPT OF NOTIFICATION FROM THE CARRIER OF ITS ARRIVAL.
  - 4. EACH LICENSEE, UPON RECEIPT OF A PACKAGE OF RADIOACTIVE MATERIAL, SHALL MONITOR THE EXTERNAL SURFACES OF THE PACKAGE FOR RADIOACTIVE CONTAMINATION CAUSED BY LEAKAGE OF THE RADIOACTIVE CONTENTS, EXCEPT:
  - 5. PACKAGES CONTAINING NO MORE THAN THE EXEMPT QUANTITY SPECIFIED IN THE TABLE.