

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 HAMPSHIRE, 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 21-21045-01

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

Kinnco Inc.
P.O. Box 802
Traverse City, MI 49685

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

8389 M-72
Williamsburg, MI 49690

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

Larry R. Kinney

TELEPHONE NUMBER:

616-938-2842

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 J AMOUNT
ENCLOSED \$ 120.00

13. CERTIFICATION
BINDING UPON
THE APPLICANT

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

Larry R. Kinney

Larry R. Kinney

General Manager

07/01/87

14. ANNUAL RECEIPTS

<\$250K	<input checked="" type="checkbox"/>	\$1M-3.5M
\$250K-500K	<input type="checkbox"/>	\$3.5M-7M
\$500K-750K	<input type="checkbox"/>	\$7M-10M
\$750K-1M	<input type="checkbox"/>	>\$10M

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

15

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

RECEIVED

TYPE OF FEE

FEE LOG

FEE CATEGORY

COMMENTS

APPROVED BY

Ren

Jul-5-III

3P

AMOUNT RECEIVED

CHECK NUMBER

\$120

10475

CONTROL NO. 83799

JUL 06 1987

REGION III

DATE

7/14/87

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY:** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
2. **PRINCIPAL PURPOSE(S):** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.
3. **ROUTINE USES:** The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.
5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

Application for Material License continued....

- 5 a.Cesium 137
b.Sealed sources
c.no single source to exceed 1.5 curies
- 6 Oilfield pipe wall inspection using NDT's Tube Wall Caliper.
- 7 Larry R. Kinney
(see attached resume)
- 8 Radiation safety meetings are integrated into the company wide safety program for individuals who frequent restricted areas. Operators of equipment receive additional training with the principles of radiation protection, the principles of radiation detection, use of survey meters, and the biological effects of radiation from the Radiation Safety Officer and outside safety consultants retained by Kincco Inc.
- 9 Kincco Inc. Williamsburg facility consists of 12 acres of pipe storage, a 120' x 60' service building with attached offices, and a yard foremans office. (see attached drawing)
- 10 See enclosed Radiation Safety and Procedures Manual.
- 11 Spent sealed sources will be disposed of using a licensed radioactive waste disposal service.

CONTROL NO. 83799.

R E S U M E

LARRY R. KINNEY
4266 Westridge
Williamsburg, Michigan 49690
(616) 938-9293

Date of Birth: January 18, 1959

Social Security No.: 378-72-8977

EXPERIENCE:

6/1974 - 8/1980 --- Employed by KINNCO, Inc., Traverse City, Michigan part-time (summers), as general roustabout and assistant inspector.

5/1981 - present -- Employed by KINNCO, Inc., Traverse City, Michigan full time as an electromagnetic inspector, using a Wilson drill pipe inspection unit.

In March, 1982, Mr. Kinney attended a course on the operation and maintenance of the NDT Systems, Inc. pipe inspection unit, utilizing a sealed source of Cesium-137.

RADIATION SAFETY TRAINING:

In April, 1982, Mr. Kinney completed a 3-day Oilfield Radiation Safety School, taught by Keith Moon of Support Consultants and Associates, Inc., Odessa, Texas (Certificate attached).

CONTROL NO. 83799

Support Consultants & Associates

This is to certify that

LARRY R. KINNEY

has successfully completed the Educational Course in

OILFIELD RADIATION SAFETY

as prescribed under The Training Program presented by
Support Consultants & Associates

KINSCO, INC.

Larry R. Kinney

Kurt Simpson
Training Officer

APRIL 16, 1982

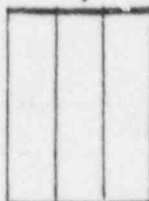
Date

Pipe
Storage

Pipe Inspection
units containing
radioactive
sources parked
here. ↴

Pipe
Storage'

Yard
Foreman's
Office



Fuel
Storage

Shop

Offices

Pipe Storage

Wooded Area

Entrance

Wooded Area

Highway M-72

KINNCO, INC.
8379 M-72
Williamsburg, MI 49690

N

Ten acre yard in Grand Traverse County, surrounded by wooded areas.

WHENEVER THIS MANUAL REFERENCES THE STATE OR FEDERAL
REGULATORY AGENCY, IT IS TO BE UNDERSTOOD THAT FOR
OPERATIONS IN THIS STATE THE AGENCY REFERENCED IS:

U. S. NUCLEAR REGULATORY COMMISSION
REGION III - OFFICE OF INSPECTION & ENFORCEMENT
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

TELEPHONE: (312) 932-2500

WHENEVER REFERENCE IS MADE TO THE RADIATION SAFETY OFFICER,
IT IS ONE AND THE SAME AS THE RADIATION PROTECTION OFFICER.

KINNCO, INC.

OPENING STATEMENT:

This manual outlines procedures pertaining to the use and handling of radioactive sources. It is the intent of KINNCO, INC. to comply in every way possible with State and Federal regulations for control of radiation. The objective of these procedures is to minimize safety problems and non-compliance problems, to minimize hazards to employees and the general public, and to prevent radiation incidents. Although our operations are such that the levels of radiation provide a low risk of exposure, we will follow procedures and practices that will maintain doses to individuals as low as is reasonably achievable.

To insure compliance with all regulations, a safety committee will be formed, consisting of:

Larry R. Kinney, Radiation Protection Officer
Keith E. Moon, Consultant

The function of the safety committee will be to regularly review the status of KINNCO, INC.'s safety procedures and policy and to be made aware of any discrepancies which exist in these programs and to insure that all company personnel are committed to a safe and proficient safety program. A copy of these procedures will be given to each named user concerned with the handling of radioactive materials. It is the responsibility of every radiation user to have a working knowledge of these procedures. If any doubt exists in regard to these procedures or the safety conditions relating to the use of the pipe inspection unit, the Radiation Safety Officer should be contacted immediately. Violation of the conditions and procedures set forth in the following instructions shall be just cause for punitive action.

In the event of an emergency involving a radioactive source, the Radiation Safety Officer will notify:

U. S. Nuclear Regulatory Commission
Region III - Office of Inspection and Enforcement
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Telephone: (312) 932-2500

RADIATION SAFETY PROCEDURES

I. RADIATION SAFETY OFFICER'S MANAGEMENT RESPONSIBILITY

- A. The Radiation Safety Officer (R.S.O.) is responsible for the over-all radiation program. These duties consist of:
1. Maintaining proper radiation safety records and personnel files.
 2. To provide an on-going training program for qualification of radiation personnel.
 3. Providing monthly checks on all radiation personnel to insure that no excessive exposures are received by employees (not to exceed 1.25 Rems per calendar quarter or no more than 5.0 Rems per calendar year.)
 4. Maintaining a personnel monitoring device.
 5. Making sure vehicles/units and facilities are surveyed monthly to determine contamination levels, if any.
 6. To insure that all transportation of radioactive materials is done in compliance with D.O.T. regulations (49 CFR).
- B. The Radiation Safety Officer is committed to make every effort to comply with State and Federal regulations for control of radiation and to report any deficiency or area of non-compliance to the radiation safety committee.

II. RECORDS MANAGEMENT

- A. A source utilization log will be kept on each tubing wall caliper that is used. (Ref: Figure #1)
- B. A record of source receiving and transfer will be kept in the master radiation files.
- C. Vehicle/unit and/or facility inspection survey reports will be made monthly. (Ref: Figure #2)
- D. Personnel exposure records will be maintained on a monthly basis.
- E. Leak test reports will be made every six months.

III. TRAINING AND QUALIFICATIONS OF PERSONNEL

- A. Any person named as radiation personnel (users) on the license must be an employee of the company who has sufficient training and experience to operate inspection equipment and who has received sufficient on-the-job training in operating the equipment and in the safe use of radioactive materials.
- B. All operations involving the use of radioactive materials will be performed by or under the personal supervision of a user named on the license or added by amendment.

- C. Before an employee is allowed to operate any equipment containing radioactive material, he will be instructed in its use, and in the related safety procedures, by the Radiation Safety Officer and/or the qualified user in charge of the operation in progress or to be encountered.

IV. RADIATION SAFETY AND MONITORING DEVICES

A. TLD Badges: (Thermoluminescent Dosimeter)

1. A TLD badge will be assigned by name and number to each employee working with radioactive materials. Under NO circumstances will an employee be permitted to use a TLD badge other than his own.
2. The Radiation Safety Officer will be responsible for the distribution of the TLD badges and the procedures governing their use. Care should be taken to prevent exposure of TLD badges to environmental conditions which involve excessive heat or moisture as such exposure will impair the ability of the badges to measure radiation dosage.
3. TLD badges will be worn attached to the body clothing (body trunk area) during all operations which involve possible exposure to radiation.
4. TLD badges will be returned to the Radiation Safety Officer, or his designated representative, at the end of the control period for the badge.
5. TLD badge reports will be kept up-to-date by the Radiation Safety Officer. These reports will become a part of each employee's personnel record by means of an individual exposure report which will be maintained on a quarterly basis by the R.S.O. Each person to whom a TLD badge is assigned will be informed of his total radiation exposure upon request or within thirty (30) days after termination.

B. Survey Meters:

1. A radiation survey meter shall be carried on each vehicle used for transportation of radioactive materials. Survey meters used shall be sensitive to gamma radiation.
2. One or more operable radiation survey meters will be kept at the base facility as a spare and for emergency use.
3. A calibration check shall be performed on each radiation survey meter at six months intervals and after repair. The calibration check shall consist of testing the survey meter at two points other than zero, on each scale using a radiation source of known output. The calibration will be performed by a State or Federally approved survey meter calibration service company. A written record of this calibration will be kept by the R.S.O. in the master radiation files.

C. Leak/wipe tests for Sealed Sources:

1. A leak/wipe test shall be performed on each sealed radiation source at six months intervals. Leak/wipe tests will be performed by the Radiation Safety Officer or other authorized user.
2. Leak/wipe tests will be performed through the use of kits according to accompanying instructions. The kits will be supplied by one of the following:

Nuclear Sources & Services, Inc., Houston, Texas
Gulf Nuclear, Houston, Texas
Eberline Instruments, Santa Fe, New Mexico
or Any other State or Federal approved company for
service, maintenance, and repair of sources.

3. Leak/wipe test reports will provide removable activity data in units of microcuries.
4. All results of leak/wipe tests will be retained for review by regulatory agents.

V. STORING, SECURING, AND TRANSPORTING RADIOACTIVE MATERIAL

A. Source Storage:

1. When not in use all sealed radiation sources shall be kept locked in their source holder.
2. Each source holder shall be posted with warning labels. (See NDT's Users Manual - Item 1: Device Labeling)
3. Detailed radiation surveys will be performed on the source holder at the following times:
 - (a) When a new source is first received.
 - (b) At any time a source holder is transferred to another licensee.
 - (c) At the time of each quarterly source inventory. A written record shall be made of the results of each survey.

B. Vehicle/Unit Surveys:

1. Detailed radiation surveys will be made on the exterior of each vehicle/unit used for transportation of radioactive material at the following times:
 - (a) Prior to transporting any radioactive material. (Ref: Figure #1)
 - (b) Once each month. (Ref: Figure #2 - Monthly Vehicle Survey)
 - (c) When a new radiation source is first carried in the vehicle.
 - (d) After any change in the construction of the source holder or its position in the vehicle.

2. Areas around a vehicle containing radioactive material are to be considered as unrestricted areas, thus, the radiation dose rate in these areas must not exceed 2 mr/hr. If the radiation dose rate at the outer surface of a vehicle/unit is found to exceed 2 mr/hr, the radiation source must be relocated or shielded so that the dose rate is reduced to 2 mr/hr or less.

VI. EMERGENCY PROCEDURES

- A. In the event of an emergency arising from malfunction of source holder device, mechanical damage, or damage to vehicle/unit:
 1. Area should be immediately surveyed with an operable radiation survey meter and the area of danger secured.
 2. Warning signs and barriers should be erected, if possible, at the 2 mr/hr line or a minimum of 15 feet from location of source holder.
 3. The Radiation Safety Officer should be notified immediately but area must not be left unattended.
 4. Proper investigation authorities must be notified.
- B. In the event of a fire:
 1. Notify all personnel in the area immediately.
 2. Attempt to put out all fires if radiation hazard is not immediately present.
 3. Notify the Fire Department and the Radiation Safety Officer.
 4. Govern the fire fighting activities by the restrictions of the Radiation Safety Officer.
 5. Do not resume work until approved by the Radiation Safety Officer.
 6. Monitor the area and all persons involved in combating the emergency.
 7. Prepare a complete history of the accident and give the details in the Emergency Procedures Report (Ref: Figure #3)

FOR FURTHER INSTRUCTIONS TAILORED SPECIFICALLY FOR THE LICENSED SOURCE, REFERENCE THE ENCLOSED USERS MANUAL PROVIDED BY NDT SYSTEMS.

UNDER NO CIRCUMSTANCES WILL A COMPANY EMPLOYEE REMOVE A SEALED SOURCE OR RADIOACTIVE MATERIAL FROM ITS SOURCE HOLDER.

SEALED SOURCES OF RADIOACTIVE MATERIALS WILL BE RETURNED TO THE MANUFACTURER FOR DISPOSAL IN COMPLIANCE WITH DEPARTMENT OF TRANSPORTATION REGULATIONS.

MONTHLY UNIT SURVEY

DATE: _____

SURVEY METER IDENTIFICATION:

Manufacturer: _____

Model No.: _____

Serial No.: _____

	(left) _____ mr/hr	
(rear) _____ mr/hr		(front) _____ mr/hr
	(right) _____ mr/hr	

Source Serial No.: _____

Isotope: _____

Signature: _____

SOURCE USE LOG
AND
TRANSPORTATION SURVEY FORM

DATE: _____

CUSTOMER NAME: _____

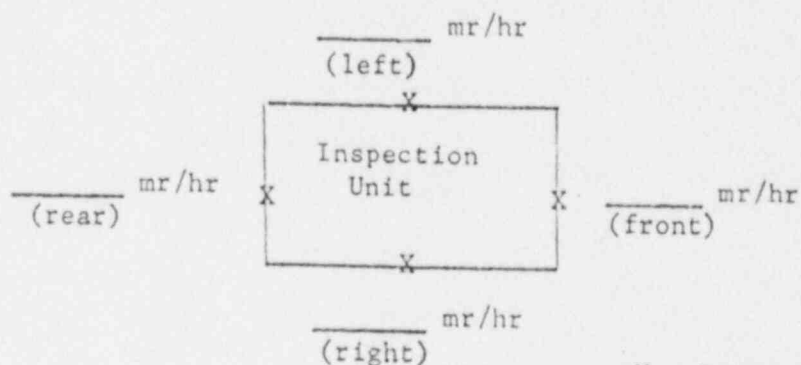
LOCATION: _____

SURVEY METER IDENTIFICATION:

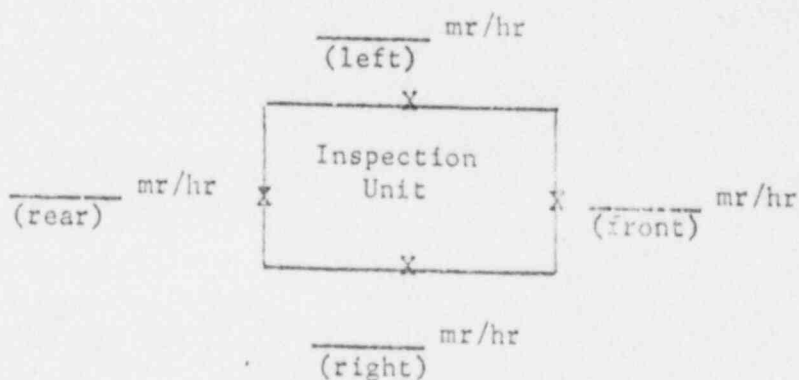
Manufacturer: _____

Model No.: _____

Serial No.: _____

Before Job Reading

X - Denotes Posting with
Radioactive Warning Signs

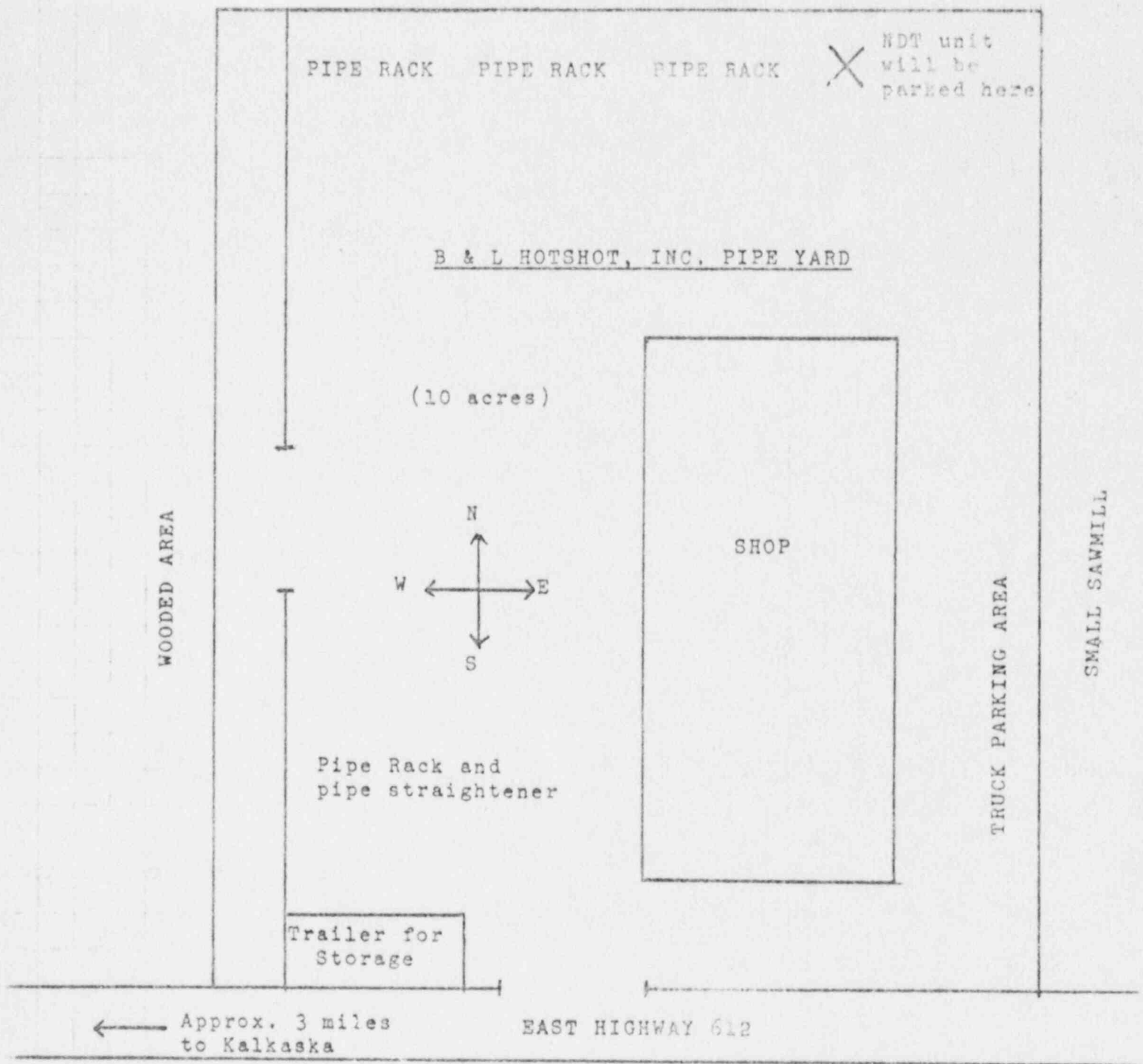
After Job Reading

Source Serial No.: _____

Isotope: _____

Signature: _____
Operator

FACILITY DRAWING



KINNCO, INC.

EAST HIGHWAY 612

KALKASKA, MICHIGAN 49646

(616) 258-9637

NDT SYSTEMS, INC. MODEL 13640 and 13640 B

TUBE WALL CALIPER

USER'S MANUAL

C O N T E N T S

- A. Identification
- B. Proposed Use
- C. Radioactive Sources
- D. Details of Construction
- E. Radiation Profiles
- F. Installation
- G. Prototype Testing
- H. Quality Control
- I. Device Labeling
- J. Pipe Wall Thickness Gauge
- K. Servicing
- L. Electronic Maintenance
- M. Shipment & Transportation
- N. Operating Procedures
- O. Assembly Drawings

A. IDENTIFICATION

NDI Model 13640, 13640 B
Tube Wall Caliper

B. PROPOSED USE

For distribution to authorized recipients for use as a tubing or pipe wall thickness gauge. Each unit will be utilized under the terms of a specific license. The Model 13640 and 13640 B may be utilized as a complete pipe inspection system, permanently mounted at the use site or in a mobile trailer or van. The unit is designed for use as a fixed or rotating head gauge at ambient temperatures and pressures.

C. RADIOACTIVE SOURCES

Cesium 137-Up to 1500 mCi
3M Model 4F6S or 4F6H

All sources are USASI rated-46535 (Certified for well logging)

D. DETAILS OF CONSTRUCTION

The source holder is solid heavy metal (Tungsten) camera utilizing a heavy metal slide from the open to closed position. Due to the extended collimation, one small well-defined beam is emitted from the Model 13640 and two small well-defined beams are emitted from the Model 13640 B. The source is secured by a tungsten plug and a bolted cover. The cover bolts are equipped with a security seal.

The "OPEN" and "SHUT" positions are plainly labeled. The OPEN/SHUT slide is equipped with an eye for locking in the closed position.

(Refer to Drawing of Model 13640 or 13640 B)

E. RADIATION PROFILES

Radiation profiles of the Model 13640 and 13640 B camera and total system with a 1.5 curie Cs-137 source are shown in Figures 1, 2, 3, & 4.

All profiles were measured with a Ludlum Model 2 geiger counter with a 44-6 gamma probe.

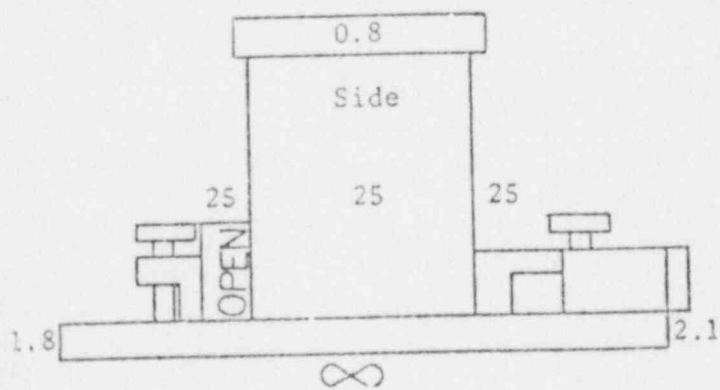
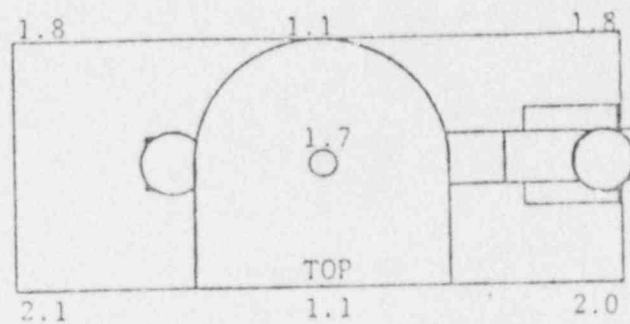
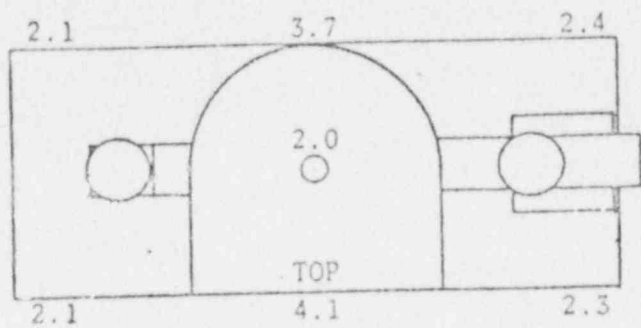
When the source camera is mounted with the detector assembly, radiation levels are less than 2.0 mr/hr on all outside surfaces of the unit in both the "OPEN" and "SHUT" position.

F. INSTALLATION

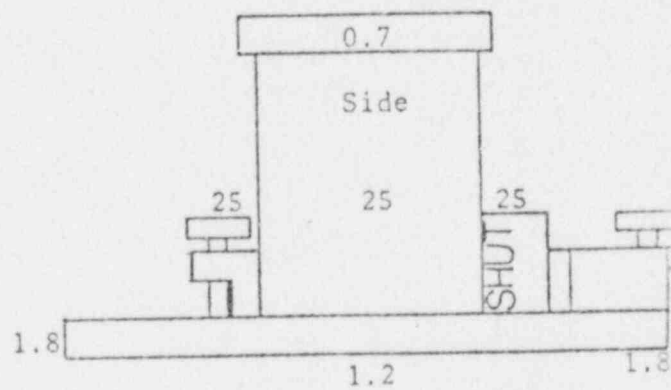
The Model 13640 or 13640 B may be mounted as a stationary or rotating unit at a fixed location or in a mobile trailer or van.

The device as mounted in a mobile trailer or van exhibits less than 2.0 mr/hr radiation level during operation and less than 2.0 mr/hr radiation level in the storage position on all outside surfaces of the unit.

RADIATION LEVEL PROFILES



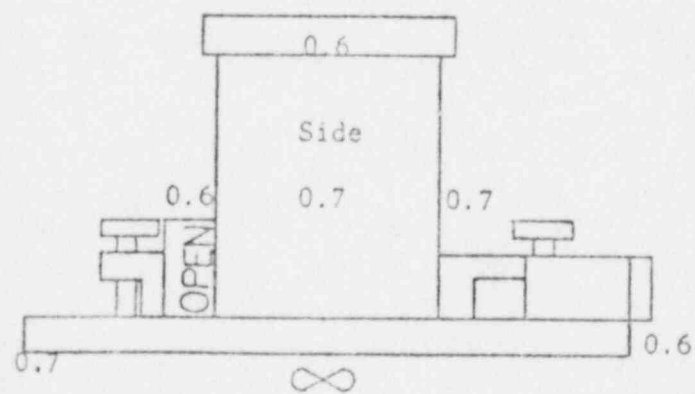
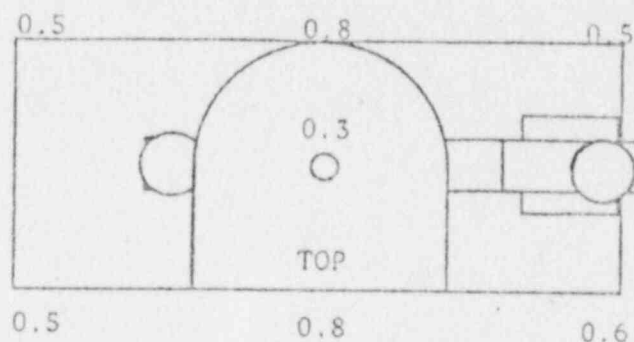
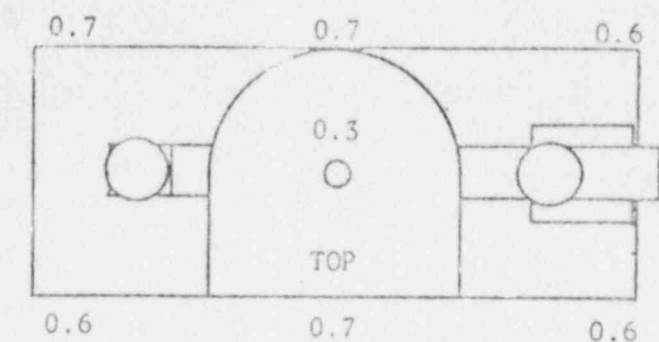
OPEN



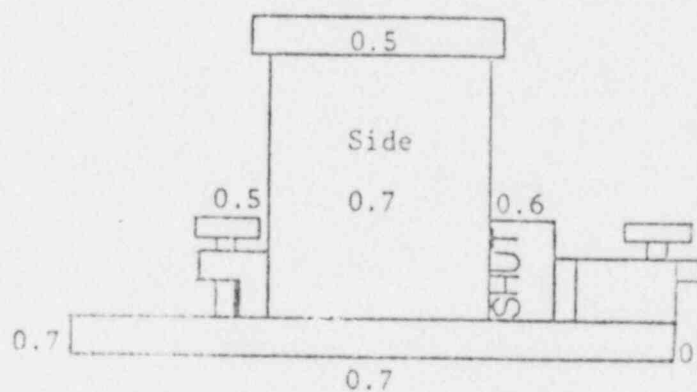
CLOSED

Figure 1
Surface Readings (MR/HR)
Model 13640
1500 Mci C_s-137

RADIATION LEVEL PROFILES



OPEN



CLOSED

Figure 2
Twelve Inches From Surface Readings (MR/HR)
Model 13640
1500 Mci Cs-137

RADIATION LEVEL PROFILES

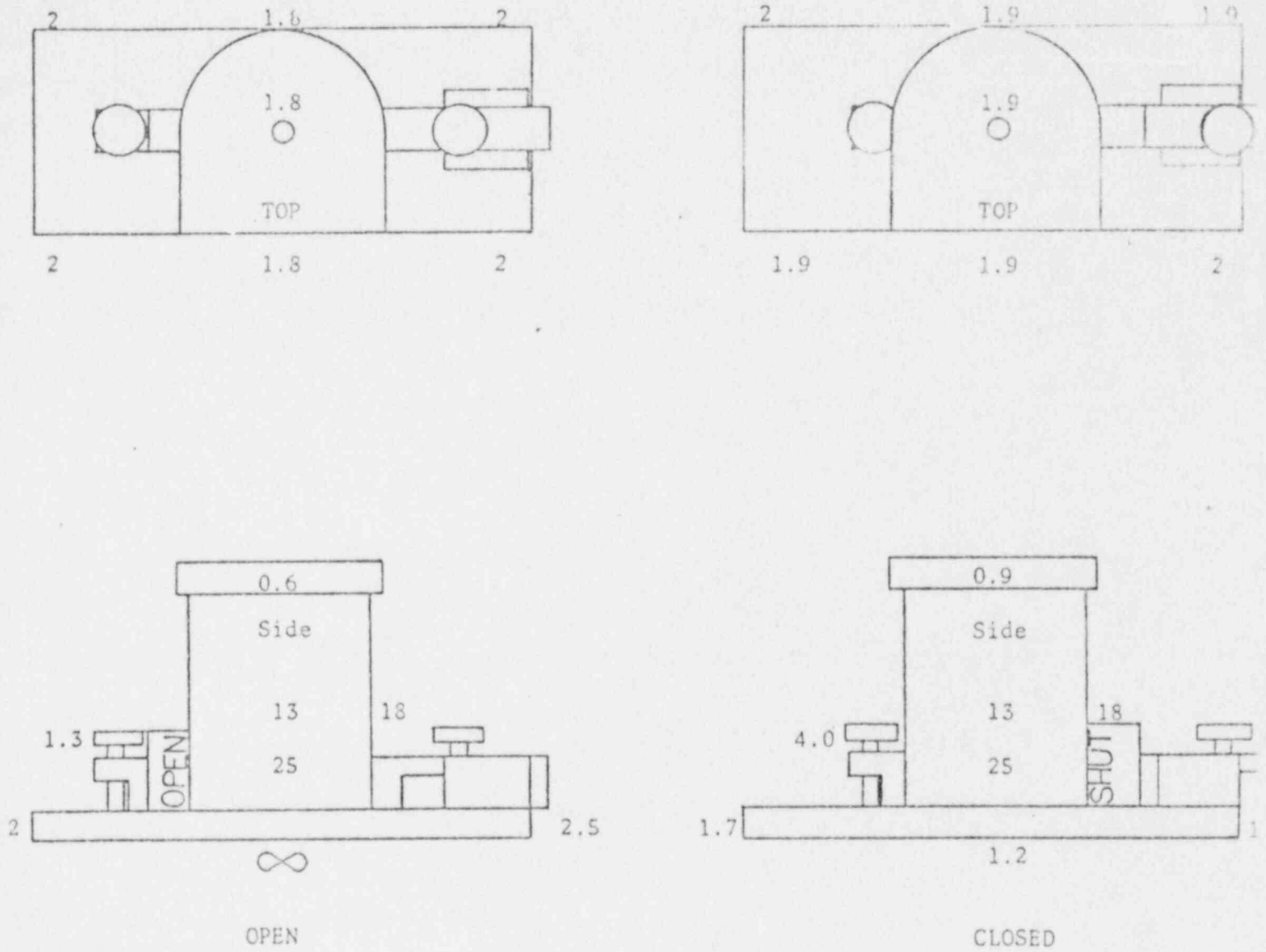


Figure 3
Surface Readings (MR/HR)
Model 13640B
1500 Mci Cs-137

RADIATION LEVEL PROFILES

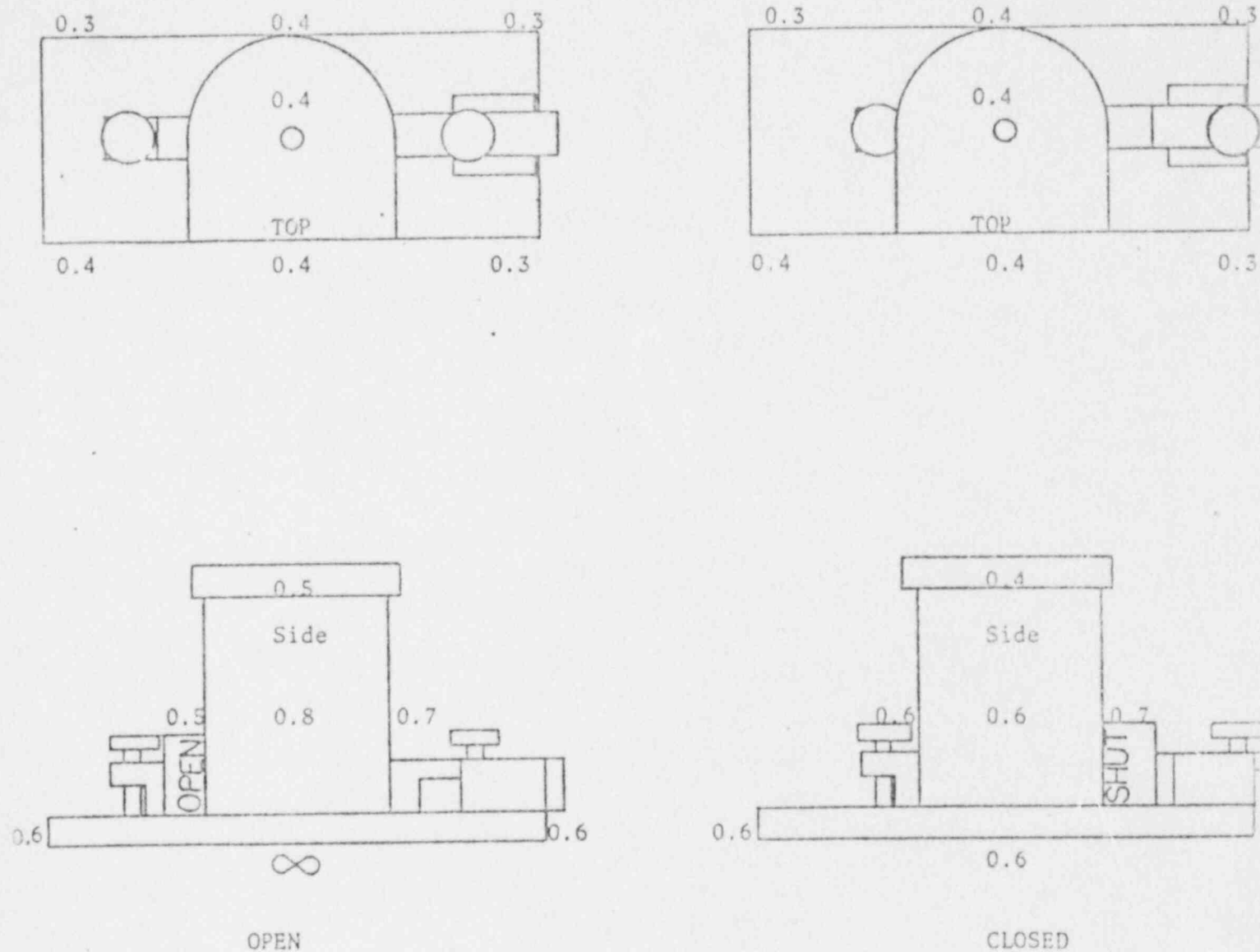


Figure 4
Twelve Inches From Surface Readings (MR/HR)
Model 13640 B
1500 Mci Cs-137

G. PROTOTYPE TESTING

The radioactive sources have been tested and certified for use in oil well logging (ASAS1 46535). The shield is of tungsten heavy metal to avoid loss of shielding in case of fire due to the high melting point of greater than 6000°F.

The "OPEN" - "SHUT" mechanism has been tested and has withstood drops and jars without accidental opening or jamming.

Workers have been utilizing the unit in a laboratory environment for 3-4 months without excessive exposures.

Since the unit may be utilized in a rotational environment up to 60 RPM stress calculations were made to assure its integrity while rotating. The calculations showed that the stresses were within reason and the design adequate.

H. QUALITY CONTROL

Quality control checks prior to delivery of completed units to customers shall include:

1. A survey of each camera after loading with a 1.5 curie Cs-137 source. The survey of the camera must match closely the initial camera survey which is a part of the device evaluation. A copy of each survey will be retained as a quality control record.
2. Each camera will be fabricated as per NDT Systems, Inc., camera drawings, and will be assembled and tested for shielding and shutter operation prior to source loading for any mechanical deficiencies.
3. Each sealed source shall be wipe tested prior to placing in a camera for shipment to a customer.



NOTICE



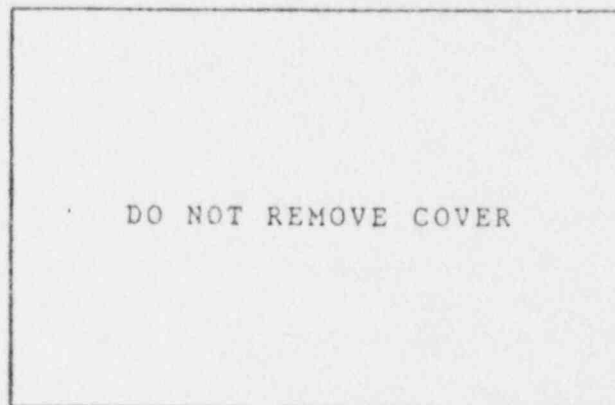
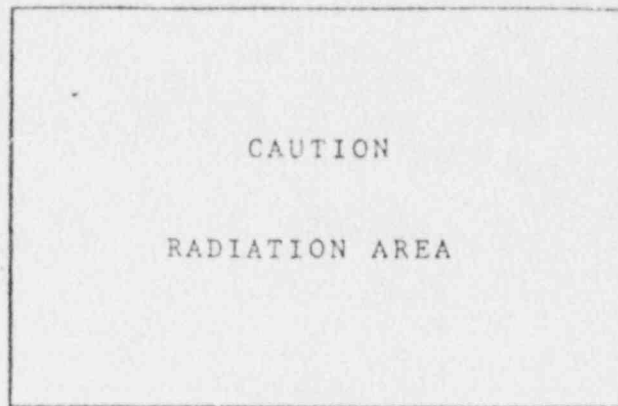
1. The receipt, possession, use, and transfer of this device, Model No 13640 or 13640 B
Serial No _____ are subject to a specific license or the equivalent and the regulations of the U.S. NRC or a State with which the NRC has entered into an agreement for the exercise of regulatory authority.
2. Abandonment or disposal prohibited unless transferred to persons specifically licensed by NRC or an Agreement State.
3. Operation prohibited if there is indication of failure of, or damage to, containment of radioactive material.
Notify NSSI - Houston, TX
(713)
Phone 641-0391 Immediately.
4. Installation, dismantling, relocation, repair, or testing shall be performed by persons specifically licensed by NRC or an Agreement State.
5. Device shall be tested for leakage of radioactive material and proper functioning of the on-off mechanism and indicator at intervals not to exceed six months.
6. Removal of this label is prohibited.
7. Operation prohibited if there is indication of failure or damage to shielding source containment or on-off mechanism.
8. Loss, theft, or transfer of this device to another licensee, and failure or damage to shielding, source containment or on-off mechanism must be reported to NRC or Agreement State.
9. Do not place hands or fingers in the air gap.

**NOTIFY CIVIL AUTHORITIES
IF FOUND**

CAUTION	
1500	MCS C-137
RADIOACTIVE MATERIAL	
	DATE
	SERIAL

WARNINGS: Under no circumstances is the source holder to be disassembled, modified, application altered, or signs changed other than its specified use. Locking mechanics should be used to deter removal by unauthorized personnel.

2. Labels as shown will be attached to the instrument housing.



WARNINGS: Under No Circumstances is the source holder to be disassembled, modified, application altered, or signs changed other than its specified use. Locking mechanics should be used to deter possible removal by unauthorized personnel.

J. PIPE WALL THICKNESS GAUGE

1. NDT MODEL 13640

PURPOSE

The NDT Model 13640 Pipe Wall Thickness Gauge measures variations in pipe wall thickness by utilizing a non-contact method.

By NDT customer supplied mechanical means the pipe is fed into the gauging device which constitutes a nuclear source and a detector system. The absorption of radiation, as the pipe passes through, is directly proportional to wall thickness or any variation in that thickness. The system is presently designed to accomodate pipe size from 1" to 17" OD, but can be increased by enlargement of the cylinder through which the pipe passes.

SYSTEM OUTLINE

The pipe wall thickness gauge consists of three basic components, a source in special source housing, one electronic detector, a mechanical device for rotating the source-detector around the pipe in order to scan the circumference and an electronic processing unit with digital and analog readout. Provisions are made for attaching a chart recorder to display the continuous detected radiation in analog form. In this section each of the three components will be described.

(1) SOURCE & SOURCE HOUSING

The source housing is designed to contain and shield 1500 millicuries of Cesium 137. The isotope, double-encapsulated, is located in a heavy metal source housing. By means of a movable shutter the source housing can be placed in an open position, thus allowing one narrow beam of radiation to pass through the beam port and impinge on the pipe wall.

Each source housing has an Isodose Chart (See Figure 1 & 2) which represents the gamma dose rate at noted distances from the surface of the source housing. A lock and key is provided to prevent unauthorized opening of the source. Once the source shutter has been placed in the "OPEN" position, and locked open, the source will emit radiation at a constant rate depending upon the half-life of the isotope.

(2) DETECTOR

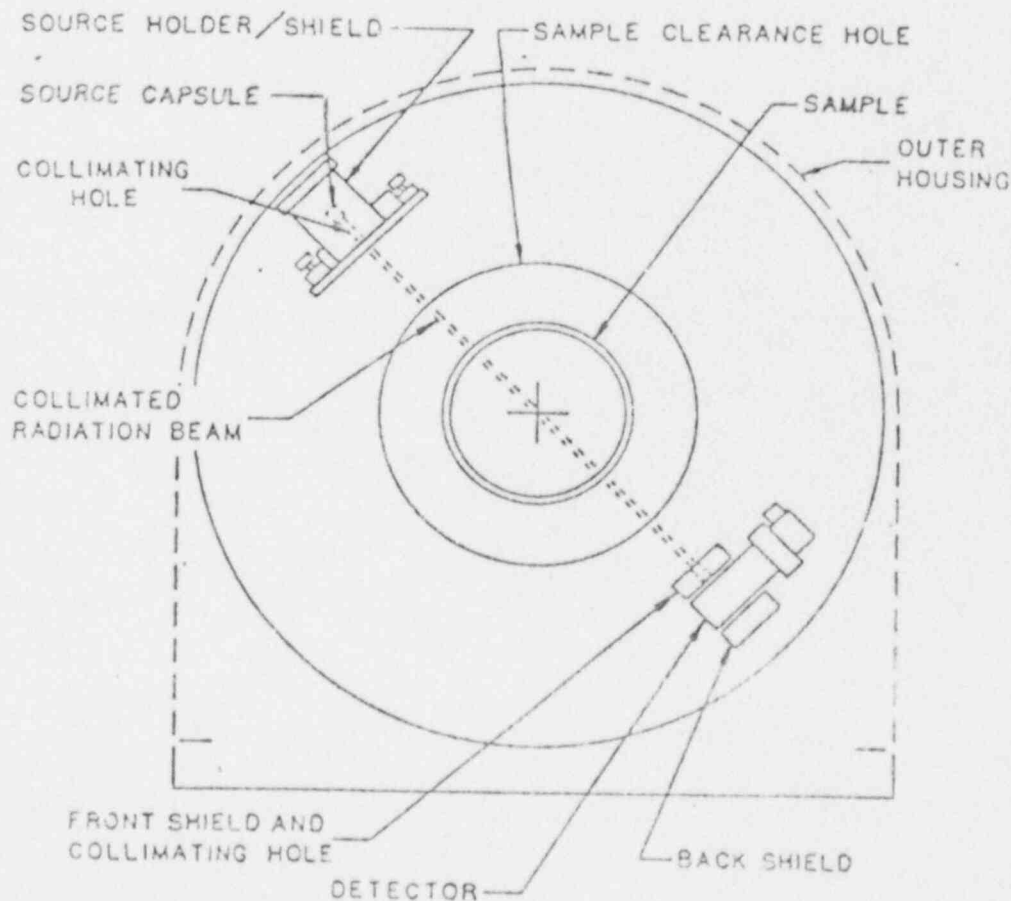
The nuclear detector comprises a scintillator (Nal) plus photomultiplier tube, amplifier and lead counter balance and beam shield. The (Nal) scintillator receives gamma energy and through physical properties, converts the incident radiation into visible light pulses.

The photomultiplier converts these signals to electrical pulses. The amplifier increases the electrical pulse amplitude so that it can be transmitted to the electronic processing unit.

The detector is located directly in front of the source beam and is mounted in such a manner that it is always facing the pipe surface at the point of impingement of the radiation beam. The radiation intensity at the detector is related directly to the wall thickness of the pipe being surveyed.

(3) MECHANICAL SYSTEM

The total gauging system operates on the basis of passing a nonrotating pipe through a circular opening and scanning the wall thickness by rotating the source-detector system. This provides a helical curve approximately 8 to 12 inches apart (dependent on pipe speed through gauge), and gives good coverage of the scanned area. The source-detector system is mounted on a rotating drum. The system is driven by motor drive belts. The motor speed can be varied as desired. The total system is mounted on a rigid frame and bolted into place for installation. Since the source and source housing as well as the detector system is rotating, the signal from the scintillation detector is transferred to stationary system by means of a carbon brush commutator. All electrical signals to the gauging device are transferred through the commutator and are fed into the electronic unit.



PURPOSE

The NDT Model 13640 B Wall Thickness Gauge measures variations in pipe wall thickness by utilizing a non contact method.

By NDT customer supplied mechanical means the pipe is fed into the gauging device which constitutes a nuclear source and a detector system. The absorption of radiation, as the pipe passes through, is directly proportional to wall thickness or any variation in that thickness. The system is presently designed to accomodate pipe size from 1" to 17" OD, but can be increased by enlargement of the cylinder through which the pipe passes.

SYSTEM OUTLINE

The pipe wall thickness gauge consists of five (5) basic components, a source in special source housing, two electronic detectors, a mechanical device for rotating the source-detector around the pipe in order to scan the circumference and an electronic processing unit with digital and analog readout. Provisions are made for attaching a chart recorder to display the continuous detected radiation in analog form. In this section each of the five (5) components will be described.

(1) SOURCE & SOURCE HOUSING

The source housing is designed to contain and shield 1500 millicuries of Cesium 137. The isotope, double-encapsulated, is located in a heavy metal source housing. By means of a movable shutter the source housing can be placed in an open position, thus allowing two narrow beams of radiation to pass through the beam ports and impinge on the pipe wall.

Each source housing has an Isodose Chart (See Figure 3 & 4) which represents the gamma dose rate at noted distances from the surface of the source housing. A lock and key is provided to prevent unauthorized opening or closing of the source. Once the source shutter has been placed in the "OPEN" position, and locked open, the source will emit radiation at a constant rate depending upon the half life of the isotope.

(2) DETECTORS

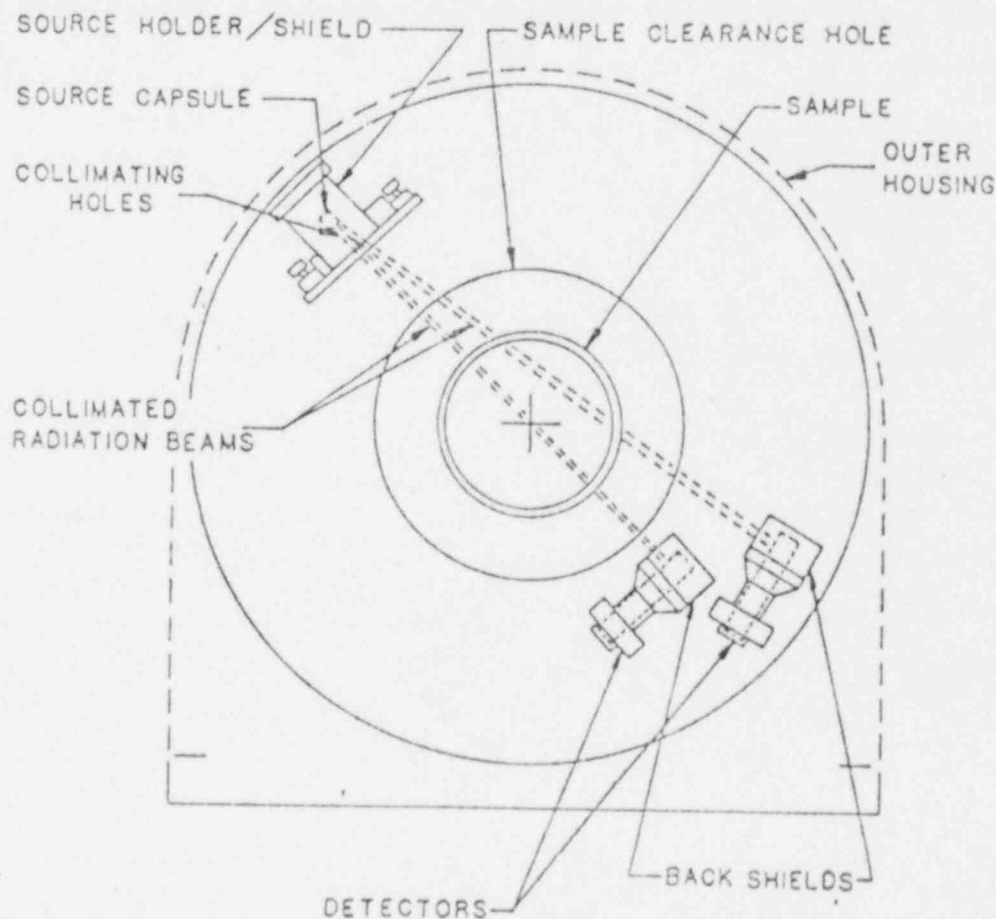
Each nuclear detector comprises a scintillator (NaI) plus photo multiplier tube, amplifier and lead counter balance and beam shield. The (NaI) scintillator receives gamma energy and through physical properties, converts the incident radiation into visible light pulses.

The photomultiplier converts these signals to electrical pulses. The amplifier increases the electrical pulse amplitude so that it can be transmitted to the electronic processing unit.

The detector systems are located directly in front of the source beams and are mounted in such a manner that they are always facing the pipe surface at the point of impingement of the radiation beam. The radiation intensity at the detector is related directly to the wall thickness of the pipe being surveyed.

(3) MECHANICAL SYSTEM

The total gauging system operates on the basis of passing a nonrotating pipe through a circular opening and scanning the wall thickness by rotating the source-detectors system. This provides a helical curve approximately 8 to 12 inches apart (dependent on pipe speed through gauge), and gives good coverage of the scanned area. The source-detectors systems is mounted on a rotating drum. The system is driven by motor drive belts. The motor speed can be varied as desired. The total system is mounted on a rigid frame and bolted into place for installation. Since the source and source housing as well as the detector system is rotating, the signal from the scintillation detector is transferred to a stationary system by means of a carbon brush commutator. All electrical signals to the gauging device are transferred through the commutator and are fed into the electronic processing unit.



K. SERVICING

Repair and maintenance work involving the source will be performed by Nuclear Sources & Services, Inc., personnel only. NDT Systems, Inc., will be limited to warranty repair of the mechanical and electronic portions of the system.

NUCLEAR SOURCES & SERVICES, INC.
P.O. Box 14023
5711 Etheridge St.
Houston, TX. 77021
713-641-0391 (24 Hour Telephone)

NDT SYSTEMS, INC.
P.O. Box 4999
119 E. 52nd St.
Odessa, TX, 79760
915-362-0378

L. ELECTRONIC MAINTENANCE

If it is determined that electronic failure in the interstage or detector has occurred, proceed as follows for replacement of components:

1. Open outer housing.
2. Move source holder to "SHUT" position and lock.
3. Place geiger counter on the side of detector which is toward source holder. Reading must be less than 2.0 mr/hr indicating source is in "SHUT" position. If higher reading is obtained, terminate procedure and follow emergency procedure.
4. Disconnect interstage unit and connect in new interstage.
5. Place test sample in sample hole, move source to "OPEN" position, replace outer housing and determine if problem is resolved.
6. If interstage replacement did not resolve problem, then open outer housing, move source holder to "SHUT" position and lock. Then replace detector. (Do not open source holder without detector mounted securely.)
7. Move source holder to "OPEN" position and close outer housing before testing to determine if repair is complete.

M. INSTRUCTIONS FOR SHIPMENT AND TRANSPORTATION

Special rules apply to transportation and shipment of radioactive materials. If any transportation of the source holder or complete device is contemplated, all packages or vehicles must comply with rules and regulations published by U.S. Department of Transportation, 46 C.F.R. Part 146, 49 C.F.R. Parts 173-179, and 14 C.F.R. Part 103.

In the event of damage or malfunction to the source holder, do not transport until the device has been inspected by an individual licensed to load the source holder and certified as safe for transportation.

For routine transportation, move source holder to "SHUT" position and lock. Remove source holder from source holder support (7 bolts). Take geiger counter and confirm radiation profile. Pack source holder so slide is protected. Label shipment in compliance with cited regulations and ship to licensed destination.

Prior to transporting any radioactive material, a "Transportation" form must be completed and appropriate placards placed on the vehicle. A sample form is attached.

TRANSPORTATION OF SOURCES

DATE & TIME: _____ LOADED _____

TRANSPORTED _____

UNLOADED _____

DRIVER _____ FILM BADGE NO. _____

VEHICLE: MAKE _____ MODEL _____ LICENSE # _____

DESTINATION _____

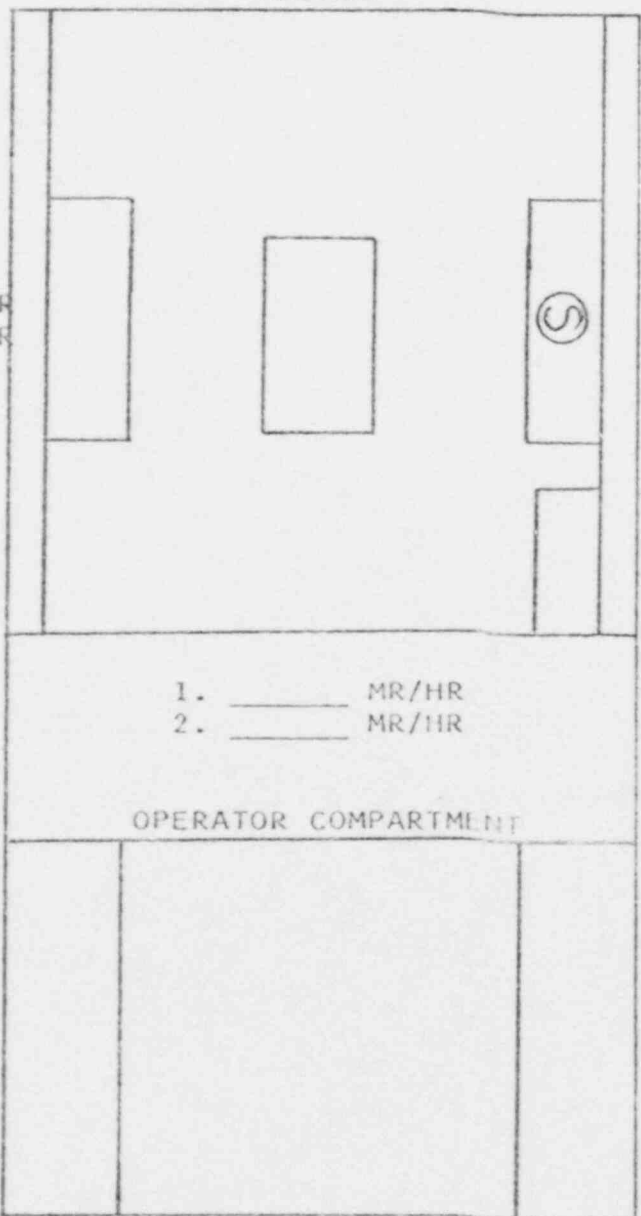
SURVEYOR _____ SURVEY METER MODEL _____

SERIAL NO. _____

1. _____ MR/HR
2. _____ MR/HR

(S) SOURCE
SERIAL # _____
ISOTOPE _____

1. _____ MR/HR
2. _____ MR/HR



1. _____ MR/HR
2. _____ MR/HR

1. _____ MR/HR
2. _____ MR/HR

!! RADIOACTIVE WARNING SIGNS
MUST BE DISPLAYED!

N. OPERATING PROCEDURES AND SURVEYS

1. Upon arrival at the job site, test procedures should be followed for the gauging system.
2. Using your G-M Survey Meter, determine the radiation dose rate by monitoring the gauge around the perimeter of the camera drum at the surface of the unit. This should be done while the source is in the "SHUT" position. Repeat the survey with the source in the "OPEN" position. CLOSE THE SOURCE AND RESURVEY THE UNIT. Check your readings against the "Isodose Chart" supplied in Figure 1,2,3 & 4 Radiation Fields. If values do not correspond with $\pm 20\%$, contact manufacturer at once.
3. Complete the assembly of all pipe transport mechanisms.
4. Turn power switch on open outer housing and move the camera shutter to the "OPEN" position. (Warning-Do Not Place Any Part of Body in Sample Hole as Radiation Overexposure May Result.) Close outer housing.
5. Complete all electronic test checks.
6. Calibrate system using standard wall calibrator.
7. System is ready to measure pipewall thickness.
8. Upon completion of the pipe testing or at the end of each day, the reverse procedure is utilized.
 - a. Open outer housing and close camera shutter and lock. Close outer housing.
 - b. Turn off power.
 - c. Check to see that source is off and survey surface of source head and assure that the unit is in the "SHUT" position.
 - d. Lock the truck or trailer to assure that no unauthorized personnel may enter. (For mobile units only.)
9. Wipe test unit every six months. To wipe test:
 - a. Obtain an approved wipe test kit or use one provided by NSSI.
 - b. Survey the source holder with a calibrated geiger counter to assure that it is in the "SHUT" position.
 - c. Follow instructions on kit and wipe the camera port.
 - d. Monitor the swab and follow instructions on the kit or camera locking mechanism.
 - e. Survey the wipe with the geiger counter. If levels are above 0.1 mr/hr notify NSSI immediately, and do not operate device.

ELECTRONIC DATA PROCESSING

All signals received from the survey unit are electronically converted to analog signals and displayed on a continuous recorder.

Adjustments of high voltage, gain signal discrimination, etc., are available at the console and at the detector.

BUYER ORIENTATION

Prior to delivery, or at the time of delivery, an NDT representative will provide a field test of the equipment which will serve an operator training period for the buyer and help insure that the buyer understands the "Operational Procedures" and the mechanics of the system. Nuclear Sources and Services Inc., offers a radiation training course to those who are completely unfamiliar with the basics of radiation monitoring and safety.

Each purchaser of an isotope thickness gauge will receive a minimum of one half day of operational experience in using the isotope system.

NDT will further advise the purchaser of the required surveys and leak tests to be performed periodically.

EMERGENCY PROCEDURE

In event of an emergency arising from malfunction of source holder device, mechanical damage, or damage to vehicle, the area should be immediately surveyed with an operable radiation survey meter and the area of danger secured. Warning signs and (if possible) personnel barriers should be executed at the 2 mr/hr line or a minimum of 15 feet from location of source holder. Notify Nuclear Sources & Services, Inc., immediately when accidents have occurred involving radioactive materials.

NUCLEAR SOURCES & SERVICES, INC.
Houston, Texas
713-641-0391 (24 Hour Telephone)

SAFETY PRECAUTIONS

1. TOTAL MECHANICAL SYSTEM SHOULD BE LOCKED AT ALL TIMES WHEN NOT IN USE OR UNATTENDED TO PREVENT POSSIBLE ACCIDENTS TO PERSONNEL.
2. COVER FOR THE PIPE DRUM SHOULD BE PRESENT WHEN THE GAUGE IS NOT BEING UTILIZED FOR GAUGING PURPOSE.
3. TAKE CAREFUL NOTE OF ATTACHED "NOTICE PLATE" CONCERNING RULES AND REGULATIONS FOR SAFETY PRECAUTIONS.
4. IN ALL OPERATING CASES, DOUBLE CHECK, SOURCE SHUTTER POSITION TO INSURE CORRECT MODE OF OPERATION.
5. IN CASE OF MALFUNCTION OF GAUGE, SOURCE OR SOURCE HOUSING ELECTRONIC DETECTOR, MOTOR DRIVE, ELECTRONIC PROCESSING UNIT OR ANY COMPONENT OF PIPE WALL THICKNESS GAUGE-SHUT DOWN OPERATION. IF PROBLEM IS NOT CORRECTED , CONTACT THE MANUFACTURER AT ONCE.
6. KEEP OPERATING AND CALIBRATED SURVEY INSTRUMENT AVAILABLE AT GAUGE SITE AT ALL TIMES.
7. CHECK ALL MECHANICAL MOUNT SCREWS DAILY OR PRIOR TO GAUGE USE TO INSURE SAFETY ASPECT OF FRAME.
8. ALL SERVICING OR MAINTENANCE OF THE SOURCE HOLDER WILL BE PERFORMED BY THE MANUFACTURER. ANY REPAIRS OR SERVICING WILL CONSTITUTE A RETURN OF THE UNIT OR A MANUFACTURER'S REPRESENTATIVE WILL REPAIR ON SITE.



TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Page 1 of 1 Page

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
12-2031	15

EDT Systems, Inc.
ATTN: R. W. Leslie
P.O. Box 4999
Odessa, Texas 79760

In accordance with letter dated February 16, 1981, signed by Bob Leslie, License No. 12-2031 is hereby amended as follows:

To change Item 4, the expiration date, from March 31, 1981 to March 31, 1986.

H:kjn

MAR 16 1981

FOR THE TEXAS DEPARTMENT OF HEALTH

Joseph E. Howell
Chief of Licensing
Radiation Control Branch

Date _____



TEXAS DEPARTMENT OF HEALTH RESOURCES
RADIOACTIVE MATERIAL LICENSE

Page 1 of 3 Pages

uant to the Texas Radiation Control Act and Texas Department of Health Resources regulations on radiation, and in reliance on stated representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transport radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas Department of Health Resources now or hereafter in effect and to the conditions specified below.

<p>LICENSEE</p> <p>Name <u>NDT Systems, Inc.</u></p> <p>Address <u>P. O. Box 4999</u> <u>Odessa, Texas 79760</u></p>		<p>This license issued pursuant to and in accordance with</p> <p><input type="checkbox"/> APPLICATION <input checked="" type="checkbox"/> LETTER</p> <p>Signed By: <u>S. R. Moore</u> Dated: <u>9-12-7</u> <u>9-14-7</u></p> <p>3. License Number <u>2-2031</u> Amendment Number <u>8</u></p> <p>4. Expiration Date <u>March 31, 1981</u></p>	
<p>PREVIOUS AMENDMENTS ARE VOID</p>			

RADIOACTIVE MATERIAL AUTHORIZED			
5. Radioisotope	6. Form of Material	7. Maximum Activity *	8. Authorized Use
Cs-137	A. Sealed Sources (3M Co. Models 4F6H or 4F6S)	A. 10 sources of 3 Ci each. Total: 30 Ci.	A. through D. For receipt, storage, use and transfer to authorized recipients in Iodium Instruments Model 3210, 3110 and Nuclear Source Services, Inc., Model 1000 Tube Wall Calipers.
Cs-137	B. Sealed Sources (Gamma-tron Model GT-GHP)	B. 10 sources of 1 Ci each. Total: 10 Ci.	B. See A above.
Ir-192	C. Sealed Sources (NEN Model VL-1)	C. 10 sources of 5 Ci. each. Total: 50 Ci.	C. See A above.

☒ CONTINUED ON PAGE 2, IF CHECKED.

CONDITIONS

Radioactive materials shall be stored at the licensee's facility located at 119 East 52nd Street, Odessa, Texas.

The licensee is authorized to use and demonstrate pipe wall thickness gauges throughout the State of Texas.

The licensee shall comply with the provisions of Part 21, "Standards for Protection Against Radiation" and Part 41, "Licensing and Registration" of the Texas Regulations for Control of Radiation.



TEXAS DEPARTMENT OF HEALTH RESOURCES
RADIOACTIVE MATERIAL LICENSE

Page 2 of 3

Supplementary Sheet

LICENSE NUMBER	AMENDMENT
2-2031	8

Radio- isotope	6. Form of Material	7. Maximum Activity	8. Authorized Use
Ir-192	D. Sealed Sources (Gamma- tron Model GI- GHP)	D. 10 sources of 1 Ci each. Total: 10 Ci.	D. See A on page 1
Cs-137	E. Sealed Sources (3M Co. Model 4F6H or 4F6S)	E. 10 sources of 3 Ci each. Total: 30 Ci.	E. For receipt, storage and distribution to authorized recipients in the licensee's Model 10333 Tube Wall Calipe specified in letter dated June 16, 1977.
Cs-137	F. Sealed Sources (3M Co. Model 4F6S or 4F6H) 4F6H	F. 10 sources of 1.5 Ci each. Total: 15 Ci.	F. For receipt, storage and distribution to authorized recipients in the licensee's Model 13640 Tube Wall Calipe specified in letters dated September 12, 1977 and September 14, 1977.

Conditions Continued:

- Radioactive material shall be used by, or under the supervision of, individuals designated by Carroll R. Thompson, the designated Radiation Safety Officer.
- The licensee shall not open or remove sealed sources containing radioactive material from their respective source holders.
- Sealed sources of radioactive material, Nickel 63 foil, and/or plated alpha emitting sources shall be tested for leakage and/or contamination in accordance with the provision of Section 41.73 of the Texas Regulations for Control of Radiation.
- The licensee is authorized to distribute to persons specifically licensed to receive them, the pipe wall thickness gauges authorized by this license in accordance with procedures submitted June 4, 1976 and September 12, 1977.



TEXAS DEPARTMENT OF HEALTH RESOURCES
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

Page 3 of 3

LICENSE NUMBER	AMENDMENT NO.
2-2031	8

Conditions Continued:

- Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in application dated February 17, 1975 and all correspondence amending the application which results in an amendment to the license.

OCT 14 1977

FOR THE TEXAS DEPARTMENT OF HEALTH RESOURCES

Joseph E. Gault
Chief of Licensing
Radiation Control Branch

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSEPage 1 of 1 Page

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
12-2031	16

NDT Systems, Inc.
ATTN: R. W. Leslie
P.O. Box 4999
Odessa, Texas 79760

In accordance with letter dated November 18, 1981, signed by R. W. Leslie,
License No. 12-2031 is hereby amended as follows:

To change Part D of Items 5, 6, 7 and 8 to read:

5. Radio- isotope	6. Form of Material	7. Maximum Activity	8. Authorized Use
D. Cs-137	D. Sealed Sources (3M Model 4F6H, 4F6S or GN Model CSV)	D. No single source to exceed 1.5 Ci.	D. Receipt, storage and distribution to authorized recipients in the licensee's Model 13640 or 13640B tube wall caliper.

FRH:kjn

DEC 09 1981

FOR THE TEXAS DEPARTMENT OF HEALTH

A handwritten signature in cursive script, reading "Joseph G. Klinger".

Date _____

OFFICIAL USE ONLY

DEVICE

MANUFACTURER & DISTRIBUTOR:

NDT Systems, Inc.
Odessa, Texas

MODEL:

13640 Tube Wall Caliper

ISOTOPE:

Cesium 137 (3M Co. Model 4F6S or 4F6H)
Up to 1.5 curies

USE:

Measures wall thickness
of pipes

DESCRIPTION:

This device has an exterior housing that is doughnut shaped with a center hole that will accomodate pipe sizes from 1 inch to 17 inches OD, but can be increased by enlargement of the cylinder through which the pipe passes. The housing is mounted on its edge so the pipe can pass through its center. The device can be used as a stationary or rotating unit at either a fixed location or in a mobile van.

Inside the housing, a tungsten source holder emits one collimated beam of radiation through the pipe to be inspected to detector on the other side of the housing with a beam stop behind it. The source holder and detectors are oppositely mounted on a frame inside the housing which rotates about the pipe as the pipe is conveyed through the device. Flaws in this section of pipe are detected by the variation in attenuation of the beam.

The source holder is made of a solid tungsten body with a tungsten slide shutter which aligns a beam collimation hole with the source when in operation. The shutter, which is plainly labeled "ON" or "OFF" can be locked in the desired position. The source is inaccessible to the user and cannot be removed unless four security wire seals are broken and the respective cover lugs removed.

RADIATION LEVELS:

When the device is in operation the radiation levels are less than 2.0 mr/h on all surfaces of the exterior housing except in the pencil-thin beam which is not accessible when a pipe is being inspected.

LABELING

The outer housing and the source holder are both labeled with the convention radioactive symbol. The source holder label also includes isotope, number of curies, date, serial number, and a warning to notify civil authorities if found.

DIATION SAFETY INSTRUCTIONS:

The manufacturer provides, prior to delivery or at the time of delivery, a field test of the equipment which serves as an operator training period for the buyer and insures that the buyer understands the "Operational Procedures" and the mechanics of the system. The manufacturer also offers a radiation training course to those who are unfamiliar with the basics of radiation monitoring and safety. Repair and maintenance work involving the source or source mechanism is performed by Nuclear Sources and Services, Inc. of Houston, Texas.

LICENSING

Because the low levels of radiation, the State of Texas does not require personnel monitoring for operators of the device. A survey meter is required, however, for making surveys and to check the source holder prior to shipment, etc. Leak tests are required every six months. The manufacturer can provide an approved leak test kit and furnishes instructions for leak testing.

Texas Department of Health

September 1977

O F F I C I A L U S E O N L Y

OFFICIAL USE ONLY

DEVICE

MANUFACTURER & DISTRIBUTOR:

NDT Systems, Inc.
P. O. Box 4999
Odessa, Texas 79760

MODEL:

13640B

ISOTOPE:

Cesium 137 (3M Co. Model 4F6S or 4F6H)
Up to 1.5 Curies

USE:

Measures wall
thickness of pipes

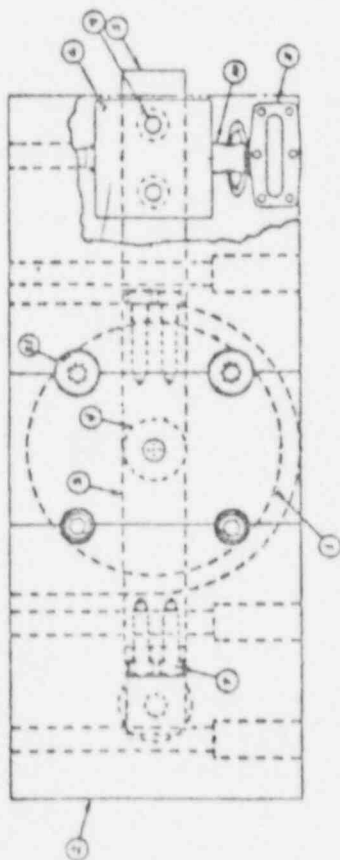
DESCRIPTION:

This model is a modification of the Model 13640. The modification incorporates the use of two pencil thin beams instead of one. One beam travels straight through the pipe and the other travels on a chord trajectory through the pipe. Both beams have beam stops on the opposite side of the pipe to stop the beam behind the two detectors. The radiation levels are about the same as those for the Model 13640, and except for the change described, all other items concerning the Model 13640 also apply to the Model 13640B.

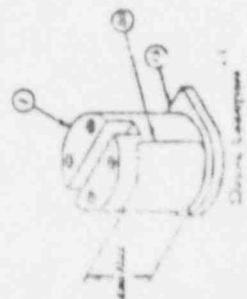
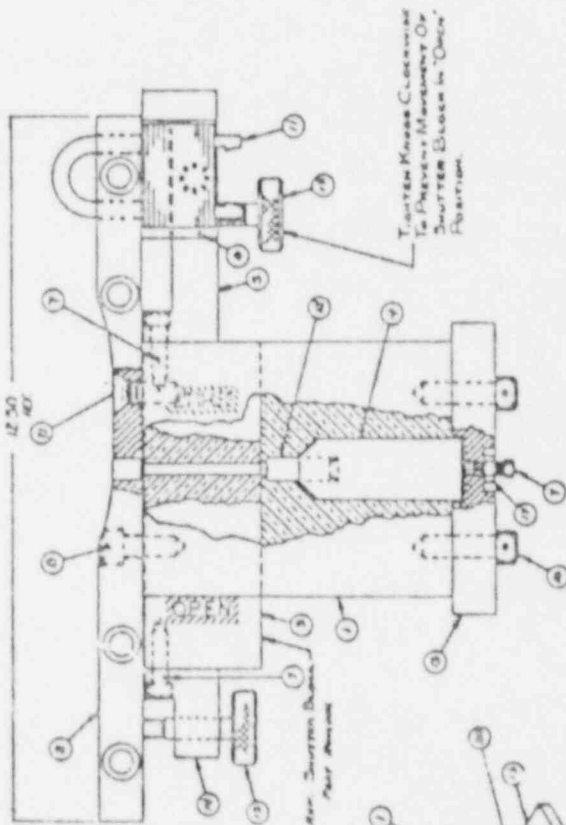
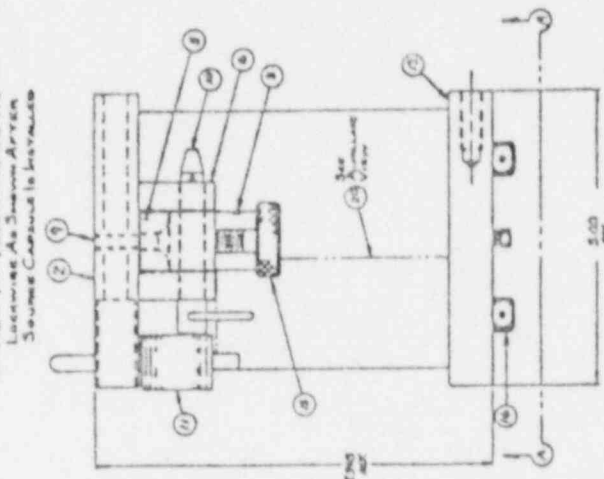
Texas Department of Health

OFFICIAL USE ONLY

November 1977



VIEW A-A, Looking Oceanward
Looking At Seaside Area
Seaside Capital to be used



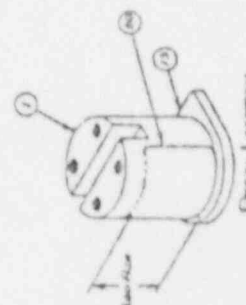
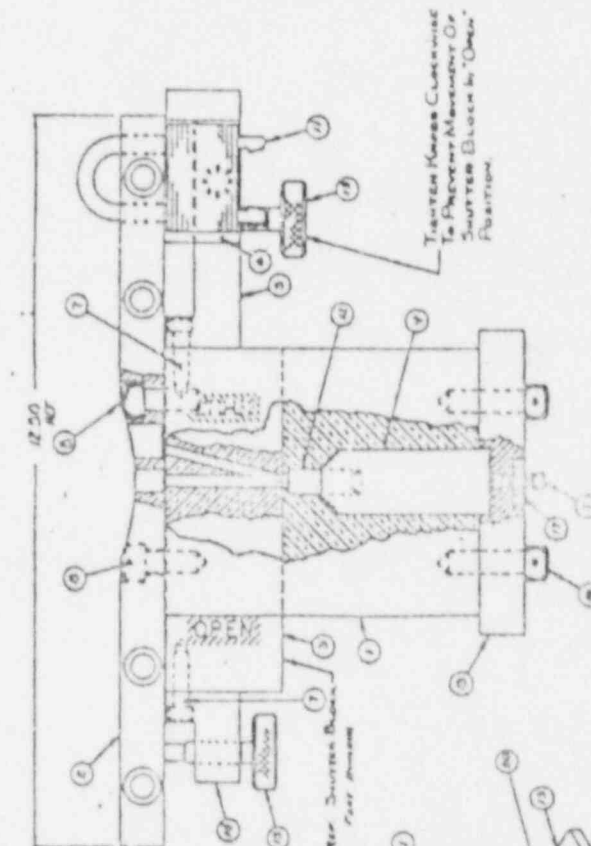
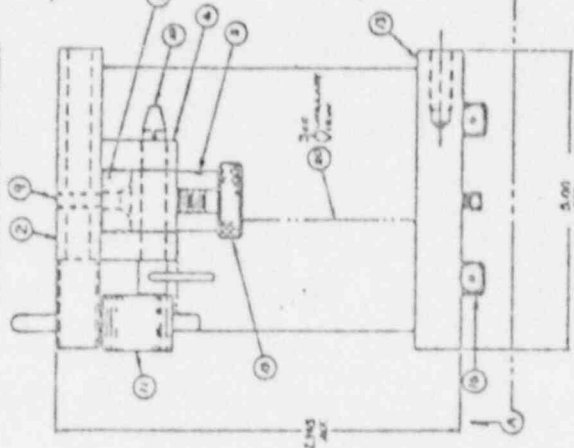
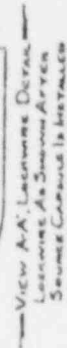
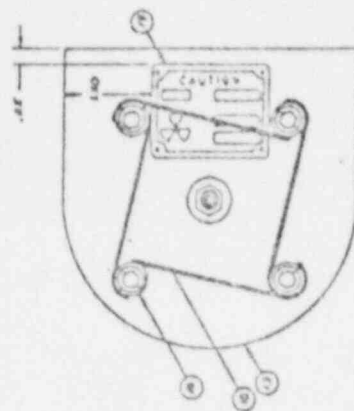
- (1) Operations Personnel must
Remain Alert, Even Learning
From And Avoiding Jewish
Scams, Etc.
- (2) Mainly More Switzer Began
Learned By Contacting Ben, Fred
& Peter In To Own Switzer And
Plan Out To Own Switzer.
- (3) After Contacting Jean Remmer
Learning Plan Involves Loan And
Transfer Over Switzer Scheme.
(In Which Switzer Owns) To
Place Switzer Machine
- (4) Switzer Condition Is Indicated
As Free Of Book On Own
Switz

CONTROL NO. 83799

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View A-A, Looking Down
Looking At Sunken Area
Sunken Canals In Dry Season



- ① Organizational Procedures Manual
- ② Reminders, Lead, Plan, Do, Learning
- ③ Plan, Do, Learn, Improve
- ④ Scenario, 1980-81
- ⑤ Manual, 1981-82
- ⑥ Manual, 1982-83
- ⑦ Manual, 1983-84
- ⑧ Plan, Do, Learn, Improve
- ⑨ Plan, Do, Learn, Improve
- ⑩ Plan, Do, Learn, Improve
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