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WARM SPRINGS
INDIAN AGENCY

SURFACE MOISTURE - DENSITY GAUGES

OPERATION PROCEDURES

8802030301 880125
REG5 LIC30
36-15080-02 PDR

Richard D. Souers 1987

OPERATING PROCEDURES

See 3400-B Series Instruction Manual.

HANDLING PROCEDURES

This instrument was designed with operator safety as a prime consideration. However, as with any piece of potentially hazardous equipment, some general precautions should be observed.

1. Do not operate or attempt to operate the instrument unless you have been authorized to do so.
2. Keep the source position in the "SAFE" or stored position when not in use.
3. Wear your Film Badge when using or transporting the instrument.
4. While exposure dose levels are well within limits for radiation workers, never expose yourself to the bare source without sufficient reason for justification of the additional dose.
5. Keep all unauthorized persons out of the operating area. A suggested distance is 5 meters (15 feet). The general public must not be unnecessarily exposed to radiation.
6. Maintain security of the instrument at all times. The source lock should be in place when not in use and the instrument should be kept on a locked vehicle when transported. When stored, the area should be locked. Not only is it an expensive piece of equipment but, if stolen, could be abandoned under conditions which could be a hazard to the general public.
7. The operator should follow these procedures and report any that he feels unsafe.
8. Insure that the gauge has had leak test measurements at the proper intervals of every six months. Use Model LTK-1 Leak Test Kit. (Test procedures are written on each kit) Mail results to:
Gulf Nuclear, Inc.
P.O. Box 58866
Houston, Texas, 77058
Ph. (713) 332-3581
9. If you have any doubts about use of the instrument. ASK. Dick Souers.

SECURITY

Regulations require that locks be maintained on radiographic equipment to prevent accidental exposure of a sealed source when not under the direct supervision of approved personnel. In addition, storage containers shall be physically secured to prevent tampering or removal by unauthorized personnel.

PERSONNEL MONITORING

The licensee shall not permit any person to use this equipment unless at all times the person is in the possession of a film badge dosimeter. Film badge reports shall be maintained for inspection. Film badges are forwarded to the Portland Area Office, Branch of Roads, on a quarterly basis. Records of film badges are kept on file at the Warm Springs Roads Office.

RECORDS

1. Licensee shall conduct a quarterly physical inventory to account for all sealed sources received and possessed under his license. The record shall be maintained for inspection at the Warm Springs Roads Office.
2. Licensee shall have all sealed sources leak tested at intervals of six months. In the absence of a certificate, the source shall not be put into use until tested.

3. Reports from film badge service shall be maintained for inspection at the Warm Springs Roads Office.
4. When an individual terminates employment with a licensee, a record of his total received dose must be made available to the employee.

INCIDENTS

The licensee must report any theft or loss of licensed material by telephone or telegram to;

Region V, USMRC
Office of Inspection & Enforcement
1990 N. California Blvd.
Suite 202
Walnut Creek, Calif. 94596
Daytime: (415) 932-8300
Nights & Holidays: (415) 932-8300

Within 30 days after the loss, a written report must be filed giving detailed description of the source, circumstances of the loss, statement of disposition, possible radiation exposures or hazard, actions taken to recover the source and procedures which will be implemented to prevent a recurrence of the loss or theft.

The licensee must report any overexposure of operators which exceeds the limits, detailing circumstances of the exposure and possible injury.

In case of field accident, rope off area and call the RADIATION SAFETY OFFICER:

Dick Souers Office: 553-1121 Ext. 423 or FTS 420-1423
Home: 475-6355 Area Code 503

If the source is retracted and the case is not broken open, place the gauge in its steel shipping case and place in its usual overnight storage area. Call the factory for shipping information.

If the source is exposed and the gauge is not broken open, at arm's length and touching only the upper gauge parts, lift or roll back the gauge to expose the end of the source rod for visual inspection. If the end of the source rod containing the radioactive source is not mechanically damaged, place the gauge in its steel shipping case in the best way possible, and place in its usual overnight storage area. Call the factory.

The source is now exposed and unshielded. Do not handle the source rod and keep all personnel ten (10) feet from the gauge at all possible times. The gauge may be moved from place to place by operator with reasonable dispatch, keeping the gauge or shipping case as far from the body as is practical.

Do not ship the gauge without explicit shipping instructions from the factory.

INCIDENTS CON'T

If the source is retracted and the gauge is broken, or if the source is exposed and mechanical damage is evident on the source rod itself, rope off area for a distance of ten (10) feet from the gauge, and from any scattered parts. Stop any vehicles which may have collided with the gauge and which could possibly have radiation contamination on tires, cleats, or tracks. Do not walk through the area and do not move the gauge or any parts. Call the RSO, the local Public Health Department Office and the factory. Call other local jurisdictional authorities as local requirements may state.

EXPOSURE LIMITATIONS

In order to protect personnel from overexposure to radiation, the Nuclear Regulatory Commission and the Federal Radiation Council have established exposure limits for radiation workers. These limits, expressed in mrems, are reproduced in the following table.

TYPE OF EXPOSURE	MILLIREM LIMITS FOR	
	13 Weeks	1 Week Rate
Sensitive Regions Whole Body, eyes, gonads, skull	1,250	96
Skin of Whole Body	7,500	577
Hands, arms, feet, ankles	18,750	1,442

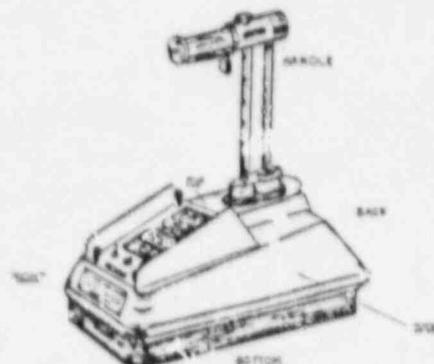
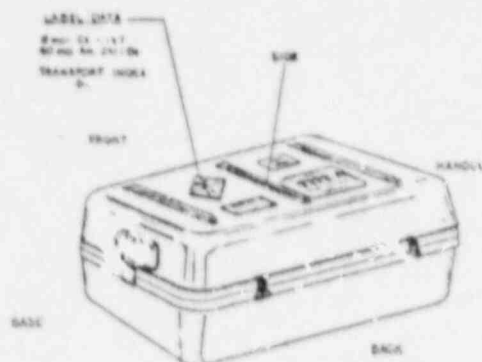
A licensee may permit an individual in a restricted area to receive a total occupational dose to the whole body greater than that permitted above, provided:

- (1) During any calendar quarter the total occupational dose to the whole body shall not exceed 3 rems; and
- (2) The dose to the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed 5 (N-18) rems where "N" equals the individual's age in years at his last birthday; and
- (3) The licensee has determined the individual's accumulated occupational dose to the whole body on Form NRC-4, or on a clear and legible record containing all the information required in that form.

TESTS & CERTIFICATIONS

- The sealed sources in this instrument (Troxler A-102112, 8 mCi cesium-137 and A-102451, 40 mCi americium-241) have been tested to an ANSI rating of C54444 and meet or exceed the requirements of:
 - Part 15 of the Official Air Transport Restricted Articles Tariff No. 6-D.
 - IATA regulations relating to carriage of Restricted Articles by air.
 - IAEA Safety Series No. 6.
 - US 49 CFR 173.398.
 - US 14 CFR 103.

The Special Form Certificate has been issued and the Competent Authority Identification mark is: GB:SPC 140 for the cesium-137 source and GB:SPC 7 for the americium-241 source.
- The 3400-B Series meets all requirements and is labeled as required by 10 CFR Parts 20 and 34.
- The packaging for this instrument (Troxler 102187 or 102382) has been tested and meets the requirements of Spec 7A containers for "TYPE A" quantities and is in compliance with:
 - Parts 6 and 11 of the Official Air Transport Restricted Articles Tariff No. 6-D.
 - IATA Regulations relating to carriage of Restricted Articles by air.
 - IAEA Safety Series No. 6.
 - US 49 CFR 172-178.
 - US 14 CFR 103.11.
- The following labels are displayed on the transport containers as required by 14 CFR 103, 49 CFR 170-190 and the Official Air Transport Restricted Articles Tariff No. 6-D.
 - "USA DOT 7A Special Form Radioactive Material"
 - Two "YELLOW II" labels indicating the contents as: 8 mCi CS-137 / 40 mCi Am-241.
 - Troxler label indicating the gauge type and serial number.

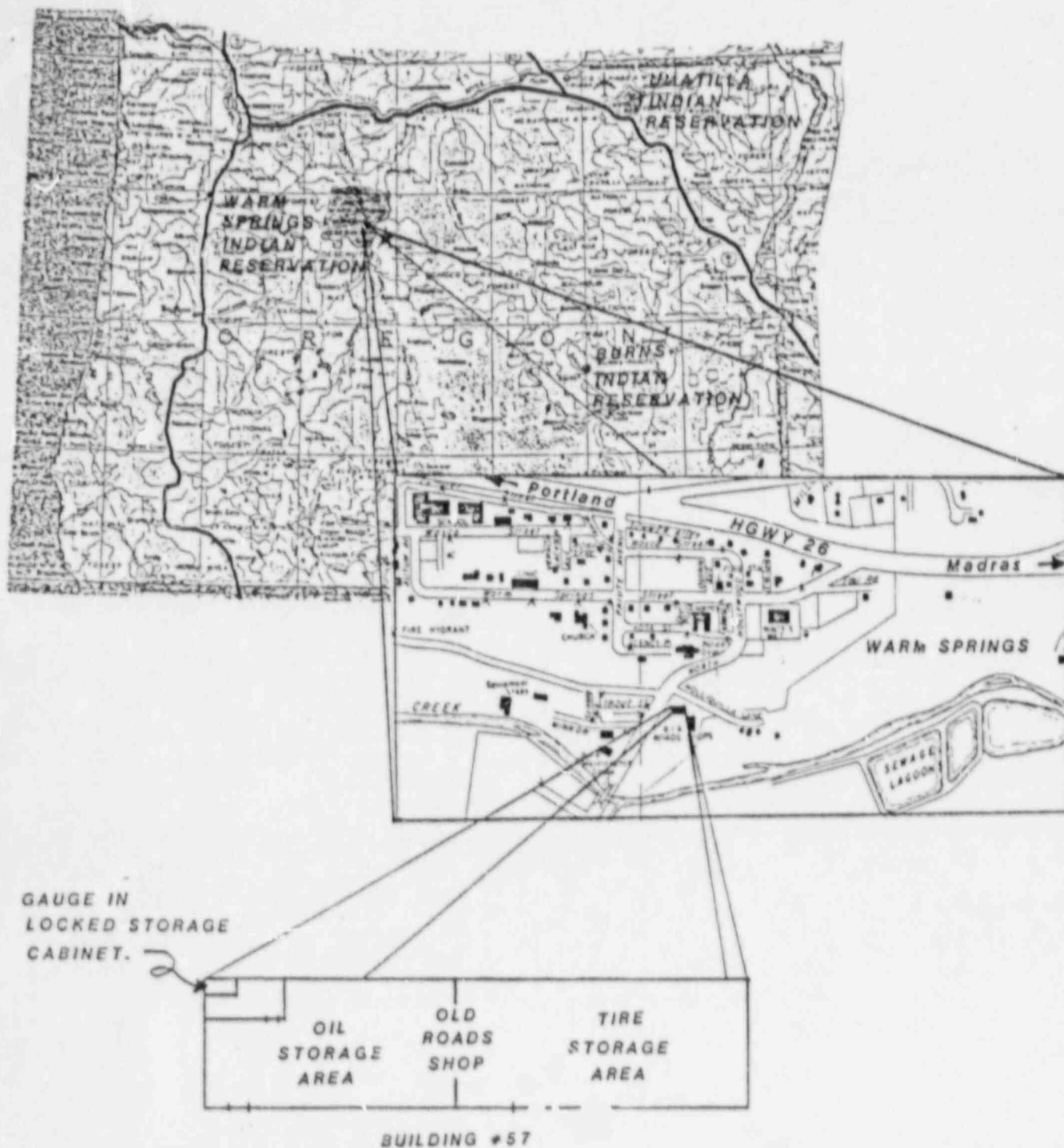


U-100 "B"111 LOCATION DOSE RATES (mR/hr)

GAUGE	SURFACE			10 CM			30 CM			100 CM		
	GAUSS	NEUTRON	TOTAL	GAUSS	NEUTRON	TOTAL	GAUSS	NEUTRON	TOTAL	GAUSS	NEUTRON	TOTAL
FRONT	4.0	1.0	5.0	40	50	90	18	10	28	04	01	05
BACK	14	1.0	15	15	30	45	2.0	18	20	03	01	04
SIDES	13	1.0	14	25	50	75	60	10	70	10	01	11
TOP	8.0	0.5	8.5	15	20	35	0.7	20	20	08	01	09
BOTTOM	8.0	3.0	11	30	17	47	18	7	25	05	01	06
HANDLE	20	32	52	08	7	30	01	1	06	---	---	---
TRANSPORT CASE												
GAUGE HANDLE	08	10	18	08	10	18	03	02	05	01	01	02
GAUGE BACK	40	1.0	41	31	20	51	12	04	16	05	02	07
GAUGE FRONT	90	1.0	91	35	20	55	15	05	20	05	02	07
GAUGE BACK	25	1.0	26	12	20	32	14	08	22	04	02	06
GAUGE SIDES	2.0	1.8	3.8	50	40	90	12	25	37	04	03	07

NOTES:
 1. GAUGE NEUTRON RATES ARE IN A NEUTRON MODEL DOSE EQUIVALENT
 2. NEUTRON DOSE RATES ARE IN A NEUTRON MODEL DOSE EQUIVALENT
 3. DOSE RATES ARE IN A NEUTRON MODEL DOSE EQUIVALENT
 4. NEUTRON DOSE RATES ARE IN A NEUTRON MODEL DOSE EQUIVALENT

NUCLEAR DENSITY GAUGE STORAGE AREA

NUCLEAR GAUGE STORAGE CABINET

KEY MAINTAINED BY RICHARD SOUERS AT THE WARM SPRINGS ROAD DEPARTMENT OFFICE.

TRANSPORTATION OF GAUGE



Gauge to be used to determine the moisture and density of road bed materials on construction projects on the Warm Springs, Umatilla and Burns Indian Reservations of Oregon. TRANSPORT BY PRIVATE MOTOR VEHICLE: This instrument in its container, will be transported by motor vehicle under the "YELLOW II" label without placarding the vehicle as required by 49 CFR 177.823.

The source rod lock shall be in place and the container placed in a portion of the vehicle which can be locked. When not in transit the instrument shall be stored in a secured area.

Since the container has a Transport Index of 0.1, it may not be stored less than 0.3 meters (1 foot) from passengers per 49 CFR 174.586. It should also not be stored for more than 8 hours at less than 1 meter (3 feet) from undeveloped film.

TRANSPORT BY COMMON CARRIER: This instrument, with the source rod lock in place and with either a wire seal through two or more latches or strapping around the outer container, meets all of the requirements of the Official Air Transport Restricted Articles Tariff No. 6-D, 14 CFR 103, 49 CFR 170-190, and the IATA Regulations relating to carriage of Restricted Articles by Air. Air transport is limited at the present time to "CARGO-ONLY" aircraft.

The shipping documents must include the Shipper's Certifications for radioactive materials as shown on the following page. The shipper retains one copy, the originating carrier retains one copy and one copy accompanies the shipment.

The AIPBIL (or waybill if other than air shipment) must include the following description:

RADIOACTIVE MATERIAL
SPECIAL FORM, (N.O.S.)
 Cesium-137, 8 mCi, Group III
 Americium-241, 40 mCi, Group I
 Type A Packaging, Transport Index 0.1
 Radioactive "Yellow II" Label Required

SHIPPER'S CERTIFICATION FOR RADIOACTIVE MATERIALS

Two completed and signed copies of this certification shall be handed to the carrier.
(Use block letters)

WARNING: Failure to comply in all respects with the applicable regulations of the Department of Transportation, 49-CFR, CAB 82 and, for international shipments, the IATA Restricted Articles Regulations may be a breach of the applicable law, subject to legal penalties. This certification shall in no circumstance be signed by an IATA Cargo Agent or a consolidator for international shipments.

This shipment is within the limitations prescribed for: (mark one)

☐ passenger aircraft and contains radioactive material intended for use in, or incident to, research, or medical diagnosis or treatment.

☒ cargo-only aircraft

NATURE AND QUANTITY OF CONTENT

PACKAGE

PROPER SHIPPING NAME	RADIONUCLIDE	GROUP	FORM	ACTIVITY	Number of Packages	CATEGORY	TRANSPORT INDEX	TYPE
FOR U.S. SHIPMENTS SEE SECTION 2, CAB 82 TARIFF 8-0	NAME OR SYMBOL OF PRINCIPAL RADIOACTIVE CONTENT	GROUP NUMBER OF GROUPS I TO VII	CHEMICAL FORM AND PHYSICAL STATE (GAS/ LIQUID/SOLID) or SPECIAL FORM or SPECIAL ENCAPSULATION	NUMBER OF CURIES or MILLI-CURIES		I-WHITE or II-YELLOW or III-YELLOW LABEL	FOR YELLOW LABEL CATEGORIES ONLY	INDUSTRIAL or TYPE A, or TYPE B
Radioactive Materials Special Form (N.O.S.) IATA Article #2129	Cesium 137 Americium 241 Beryllium	III I	Spec. Form Type "A" Spec. Form Type "A"	.008 Curies .040 Curies	(1)	II-Yellow	0.1	Type A

ADDITIONAL INFORMATION REQUIRED FOR FISSILE MATERIALS ONLY

EXEMPTED FROM THE ADDITIONAL REQUIREMENTS FOR FISSILE MATERIALS SPECIFIED IN 8.1 OF PART 2 OF THE IATA RESTRICTED ARTICLES REGULATIONS ☐
NAME PLUS QUANTITY IN GRAMS, OR CONCENTRATION, OR ENRICHMENT IN U235:

NOT EXEMPTED: FISSILE CLASS I ☐ FISSILE CLASS II ☐ FISSILE CLASS III ☐

Additional certificates obtained by the Shipper when necessary:

Special Form Encapsulation Certificate(s) ☐

Certificate(s) for Large Radioactive Source ☐

Type "B" Package Certificate(s) ☐

Government Approvals/Permits ☐

Certificate(s) for Fissile Material ☐

Special Handling Information

I hereby certify that the contents of this consignment are fully and accurately described above by Proper Shipping Name and are classified, packed, marked, labelled and in proper condition for carriage by air according to applicable national governmental regulations, and for international shipments the current IATA Restricted Articles Regulations.

Name and full address of Shipper: Troxler Electronic Labs., Inc. P.O. Box 12057 Research Triangle Park, N. C. 27709	Name and title of person signing Certification: Ruth Scarborough Secretary
Date: June 21, 1979 (W-9281)	Signature of the Shipper (see WARNING above): Ruth Scarborough
Air Waybill No. *	Airport of Departure * Airport of Destination *

* This box is optional for completion by issuing carrier.

Form 30-057 Printed and Sold by LHM & Co., Division of Solid Printing Corp., 180 Southern Ave., Jersey City, N.J. 07304 - N.J. (201) 795-5400/1-1 (212) 344-2275
Toll-free (800) 521-3706