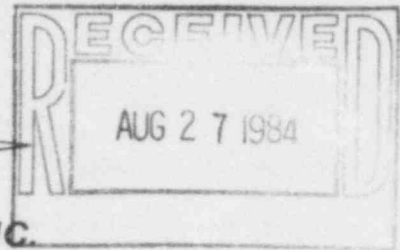


PRO-TECHNICS, INC.



August 15, 1984

MS-12

U. S. Nuclear Regulatory Commission - Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

Attn: Mr. Jack E. Whitten  
Material Radiation Protection Section

RE: Pending License Application - Control No. 60302

Your letter of July 18, 1984, requested additional information and clarification in order to complete your review of our byproduct material license application. Following is the information requested:

- ✓ 1. Enclosed is a copy of the information on the DOT 7A container which was given to us by the manufacturer. The container will be locked in a compartment or chained to the deck of the transport vehicle or trailer.
- ✓ 2. Enclosed is a brochure giving information on the G. E. Smith meter, Model GS-500P, which we will have available in Casper.
3. Enclosed is an amended "Opening Statement" for our training manual which provides for annual safety meetings to provide instructions regarding radiation hazard associated with our operations, including personnel who do not handle the materials.
- ✓ 4. Please reference Section 2 - Operating and Emergency Procedures in the manual submitted with our application. Section VI gives procedures for handling isotopes on location. Section VI, B-3 and F-1, which applies more to our operations, give instructions to set up a restricted area to protect against unauthorized entry into our work area.
- ✓ 5. Please reference the Memo to Training File at the back of Section 1. We will provide to each radiation handler a copy of our Operating and Emergency Procedures manual for their review prior to designating as a radiation handler. A copy of the manual will be available in the radiation files at all times. All items outlined in Item 5 of your letter are in our Operating and Emergency Procedures Manual.

If you need any additional information, please advise.

Sincerely,

Thomas R. Bandy  
President

MS-12

pm 8411280009 840917  
NMS LIC30  
05-23135-01 PDR  
Enclosures  
cc: SC&A, Inc.

60302

## TYPE A PACKAGING CONTAINER

This container has been tested in accordance with specifications set out in 49 CFR, Part 173.398 (b)(3) and to meet or exceed USA DOT 7A standards. The container was designed and tested to transport low level radioactive materials only.

**DESCRIPTION:** 1/8" heat treated steel with 3/4" grade A plywood liner with 1/8" lead shroud between wood liner and metal box. Completely removable outer steel spring loaded lid and 3/4" wood and lead removable inner lid.

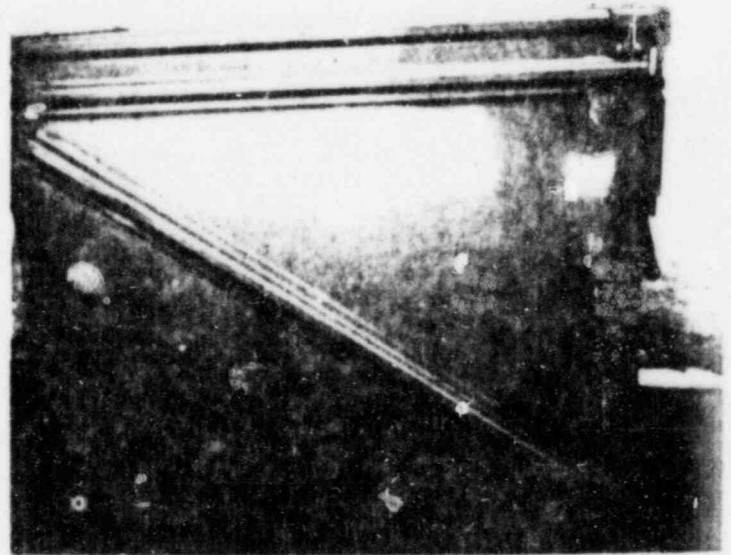
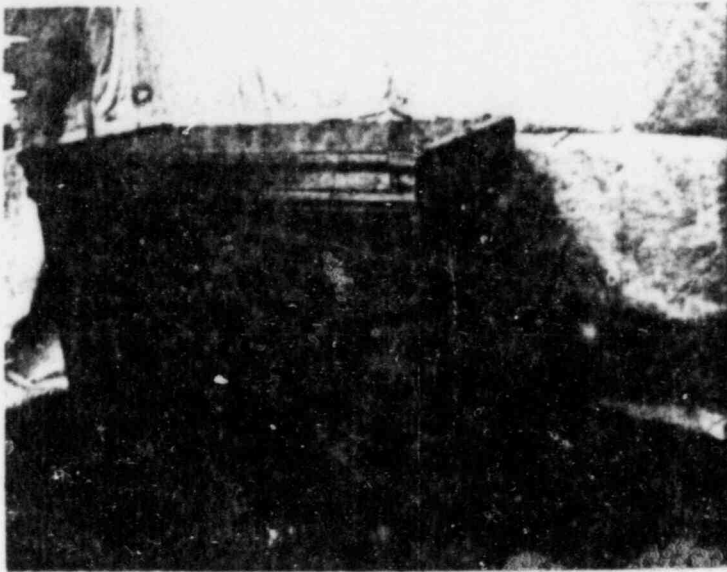
**LABELING:** Container is painted International Safety Yellow with Radioactive-Yellow III placards on the upper right corner of each broad side. There are three USA DOT 7A black on white labels, two on opposite sides and one on the removable lid. A 7" x 10" "Caution Radioactive Material" label is on the lid, plus the International Radioactive three-bladed symbol in magenta on yellow. Also, a warning stripe in magenta on yellow is on the reinforcement bar of the box.

### **SPECIAL WARNINGS & LIMITATIONS:**

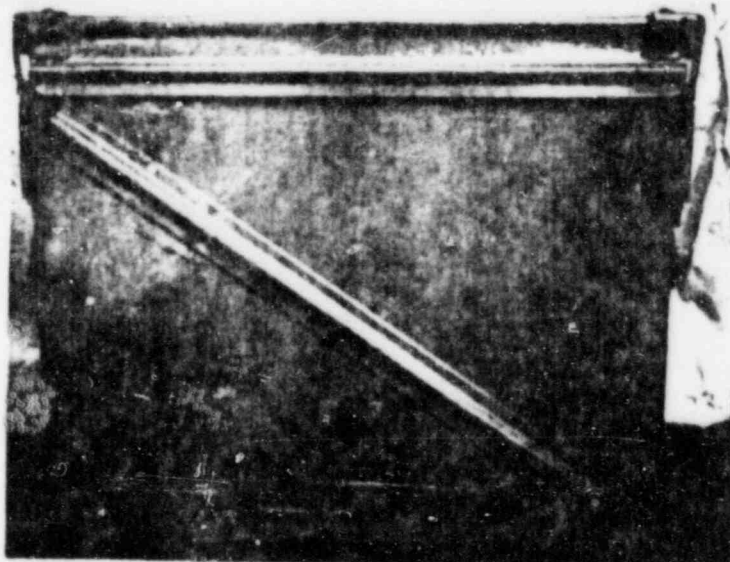
This container is designed for the sole purpose of transportation of low level radioactive materials such as those used in oilfield tracer applications. It is not designed to transport encapsulated sources of any kind. When this container is not in use, it should be stored in a radiation control area, such as those outlined in 10 CFR, because of the possibility of low level residual contamination on the outside of the box. When in transport, container should be under lock and key. If container is damaged internally or externally, causing the lid not to close firmly, it no longer meets the USA DOT 7A standards, therefore, it is no longer suitable for use.

TESTING & RESULTS:

A copy of this test should be kept on file  
in the Radiation Master file.



Photographs 1 and 2 reflect the box before any tests performed

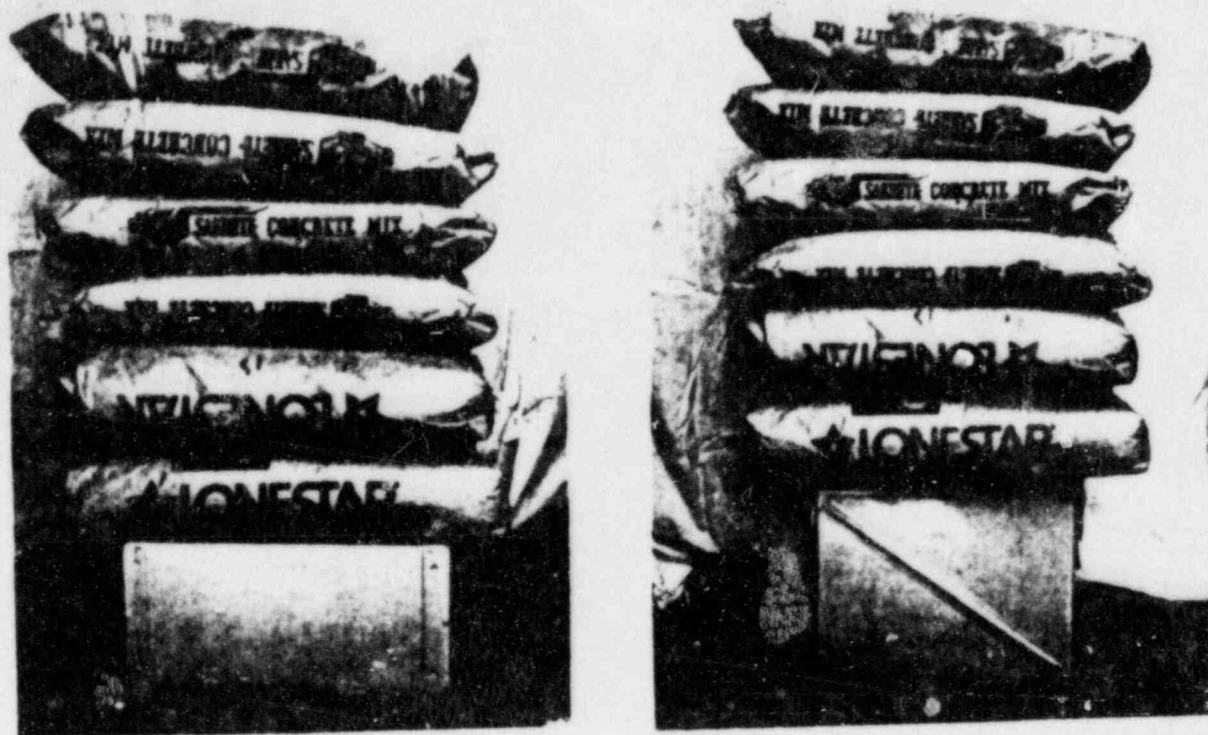


Photograph 3 shows box after testing 49 CFR Part 173.398 (b)(3)

- Item (i) Exempt because of construction materials
- Item (ii) Free drop test at 4'4"
- Item (iii) Exempt
- Item (iv) Penetration test (13 lb. rod 1½" D, dropped from 44" height)
- Item (v) Compression test - 26 hrs. under load of 508 lbs.

RESULTS:

Photograph 3 reflects minor dent on side of container, but  
no effects on structural integrity of container.  
This photo also shows no damage from drop test other than  
minor paint scrapes.



Photographs 4 and 5 show container after compression test

**RESULTS:**

No disfigurement, warping or springing was incurred. Container was also tested at temperatures of 160 degrees and sub zero temperatures to -40 degrees Fahrenheit for a period of 24 hours with no loss in structural integrity.

**CONCLUSIONS:**

This container meets or exceeds all specifics and requirements set out in 49 CFR, Part 173.398 (b) (3) (i) thru (v) test conditions.



Photograph 6 shows transportation container with labels



able (non-fixed) radioactive contamination may be determined by wiping the external surface of the package with an absorbent material, using moderate pressure, and then measuring the activity on the wiping material. If the measured activity per square centimeter does not exceed 10 percent of the levels prescribed above, it may be assumed that those levels have not been exceeded. Other measurement methods of equal or greater efficiency may also be utilized.

(b) When radioactive materials packages are consigned as exclusive use, as defined in § 173.389(o), removable non-fixed radioactive contamination may not exceed 10 times that as specified in paragraph (a)(1) of this section.

(c) Each transport vehicle used for transporting radioactive materials as exclusive use, as defined in § 173.389(o), must be surveyed with appropriate radiation detection instruments after each use. A vehicle may not be returned to service until the radiation dose rate at any accessible surface is 0.5 millirem per hour or less, and there is no significant removable radioactive surface contamination, as defined in paragraph (a) of this section.

[Amdt. 173-90, 39 FR 45243, Dec. 31, 1974]

#### § 173.398 Special tests.

(a) **Special form material:** To qualify as special form material, the radioactive material must either be in massive solid form or encapsulated. Each item in massive solid form or each capsule must either have no overall dimension less than 0.5 millimeters, or must have at least one dimension greater than 5 millimeters. Each item, or the capsule material, must not dissolve or convert into dispersible form to the extent of more than 0.005 percent, by weight, by immersion for 1 week in water at pH 6-8 and 88° F., and a maximum conductivity of 10 micromhos/centimeter, and by immersion in air at 88° F. If in massive solid form, the radioactive material must not break, crumble, or shatter if subjected to the percussion test prescribed in this section, and must not melt, sublime, or ignite at temperatures below 1,000° F. If encapsulated, the capsule must retain its contents when subjected to all of the

performance tests prescribed in this section, and must not melt, sublime, or ignite at temperatures below 1,475° F.

(1) **Free drop.** A free drop through a distance of 30 feet on to a flat essentially unyielding horizontal surface, striking the surface in such a position as to suffer maximum damage.

(2) **Percussion.** Impact of the flat circular end of a one inch diameter steel rod weighing three pounds, dropped through a distance of 40 inches. The capsule or material shall be placed on a sheet of lead, of hardness number 3.5 to 4.5 on the Vickers scale, and not more than one inch thick, supported by a smooth, essentially unyielding surface.

(3) **Heating.** Heating in air to a temperature of 1,475° F. and remaining at that temperature for a period of 10 minutes.

(4) **Immersion.** Immersion for 24 hours in water at room temperature. The water shall be at pH6-pH8, with a maximum conductivity of 10 micromhos/cm.

**NOTE 1:** Each shipper of special form radioactive material shall maintain on file for at least one year after the last shipment, and be prepared to provide the Department, a complete certification and supporting safety analysis (see Note 2) demonstrating that the special form material meets the requirements of paragraph (a) of this section. This requirement is effective December 31, 1974.

**NOTE 2:** Prior to the first shipment of a special form radioactive material outside of the United States, each shipper shall obtain a Certificate of Competent Authority for the specific material. Each petition must be submitted in accordance with § 173.393b (b) and (c), and must additionally include the following information:

a. A detailed description of the material, or if a capsule, the contents. Particular reference must be made to both physical and chemical states;

b. A detailed statement of the design of any capsule to be used, including complete engineering drawings and schedules of material, and methods of construction;

c. A statement of the tests which have been done and their results, or evidence based on calculative methods to show that the material is capable of meeting the tests, or other evidence that the special form radioactive material meets the requirements of paragraphs (a)(1) thru (4) of this section.

#### (b) Standards for Type A packaging:

(1) Type A packaging must be so designed and constructed that, if it were subject to the environmental and test conditions prescribed in this paragraph:

(i) There would be no release of radioactive material from the package;

(ii) The effectiveness of the packaging would not be substantially reduced; and

(iii) There would be no mixture of gases or vapors in the package which could, through any credible increase of pressure or an explosion, significantly reduce the effectiveness of the package.

#### (2) Environmental conditions:

(i) **Heat.** Direct sunlight at an ambient temperature of 130° F. in still air.

(ii) **Cold.** An ambient temperature of -40° F. in still air and shade.

(iii) **Reduced pressure.** Ambient atmospheric pressure of 0.5 atmosphere (absolute) (7.3 p.s.i.a.).

(iv) **Vibration.** Vibration normally incident to transportation.

(3) **Test conditions:** The packaging shall be subject to all of the following tests unless specifically exempted therefrom, and also to the consecutive application of at least two of the following tests from which it is not specifically exempted:

(i) **Water spray.** A water spray heavy enough to keep the entire exposed surface of the package except the bottom continuously wet during a period of 30 minutes. Packages for which the outer layer consists entirely of metal, wood, ceramic, or plastic, or combinations thereof, are exempt from the water spray test.

(ii) **Free drop.** Between 1½ to 2½ hours after the conclusion of the water spray test, a free drop through a distance of 4 feet onto a flat essentially unyielding horizontal surface, striking the surface in a position for which maximum damage is expected.

(iii) **Corner drop.** A free drop onto each corner of the package in succession, or in the case of a cylindrical package onto each quarter of each rim, from a height of 1 foot onto a flat essentially unyielding horizontal surface. This test applies only to packages which are constructed primarily of wood or fiberboard, and do not exceed

110 pounds gross weight, and to all Fissile Class II packagings.

(iv) **Penetration.** Impact of the hemispherical end of a vertical steel cylinder 1½ inches in diameter and weighing 13 pounds, dropped from a height of 40 inches onto the exposed surface of the package which is expected to be most vulnerable to puncture. The long axis of the cylinder shall be perpendicular to the package surface.

(v) **Compression.** For packages not more than 10,000 pounds in weight, a compressive load equal to either five times the weight of the package or 2 pounds per square inch multiplied by the maximum horizontal cross section of the package, whichever is greater. The load shall be applied during a period of 24 hours, uniformly against the top and bottom of the package in the position in which the package would normally be transported.

(c) Standards for hypothetical accident conditions of transportation for Type B packagings:

(1) Type B packaging must meet the applicable Type A packaging standards and must be designed and constructed and its contents so limited that, if subjected to the hypothetical accident conditions prescribed in this paragraph, it will meet the following conditions:

(i) The reduction of shielding would not be enough to increase the radiation dose rate at three feet from the external surface of the package to more than 1,000 millirem per hour.

(ii) No radioactive material would be released from packages containing Type B quantities of radioactive material. The allowable release of radioactivity from packages containing large quantities of radioactive material is limited to gases and contaminated coolant containing total radioactivity exceeding neither 0.1 percent of the total radioactivity of the package contents nor 0.01 curie of Group I radionuclides, 0.5 curie of Group II radionuclides, and 10 curies of Groups III and IV radionuclides, except that for inert gases the limit is 1,000 curies.

(2) **Test conditions:** The conditions which the package must be capable of withstanding must be applied sequentially, to determine their cumulative

SUPPLEMENT TO CERTIFICATION OF DOT TYPE A PACKAGING CONTAINER:

The U. S. Department of Transportation made changes in their rules and regulations (49 CFR) which became effective July 1, 1983 which affect the specifications for DOT 7A package design and testing. The regulations allow for continued construction under the previous specifications (49 CFR Part 173.398) for a period of two years.

49 CFR Part 173.398 has been replaced by 49 CFR Parts 173.465 and 173.466 in the new regulations, therefore, references in this certification are not applicable to the new regulations. The new regulations should be referenced in this regard.

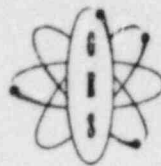
Another change in DOT regulations affects the labeling on this container. 49 CFR 172.101 "Hazardous Materials Table" changes the identification number for radioactive materials. This container will be labeled "UN2982" which is the I.D. number for radioactive material n.o.s., for transporting radioactive tracer materials.

Date:

12-8-83

  
\_\_\_\_\_  
Signature

# TECHNICAL DATA



*G.E. Smith & Associates*

919 HERBERT • PASADENA, TEXAS 77506

(713) 475-2986

## MODEL GS-500 P SURVEY METER FOR FIELD OR LABORATORY USE

### FEATURES

Simplicity

Lightweight, Rugged, Two-Piece Aluminum Case Construction

Large 3½" Ruggedized Meter Indicator

Battery Test Position, External Detector Probe

Reliability and Accuracy — Regulated High and Low  
Voltages Insures Stable, Dependable Results

### SPECIFICATIONS

Ranges	0-500, 0-50, 0-5, 0-0.5 mr/hr
Precision	within 10% of full scale at standard temperature over operating range.
Calibration	within 10% when calibrated with Cesium-137.
Radiation Detected	Beta, Gamma, and X-Ray
Environmental Effects	Temperature Limits — 30° to + 50°C Excluding Batteries. Humidity Limits 0-99% non-condensing.
Detector & Probe	Halogen Quenched Geiger Mueller Tube. Effective Length: 1.1 inches Effective Diameter: 0.482 inches. Wall Thickness: 30 mg/cm <sup>2</sup> Probe has rotating Beta window.
Controls	Six Position Rotary Switch: Off, Battery Check, X-1,000, X-100, X-10, and X-1.
Battery Complement	Two "D" size cells
Battery Life	Over 150 hours of continuous service.
Dimensions	4¾ in. wide x 7⅝ in. long x 7⅜ in. high, including handle and Probe
Weight	3 pounds 9 ounces including batteries

Price F.O.B. Pasadena, Texas

PRO-TECHNICS, INC.

RADIATION SAFETY TRAINING MANUAL

OPENING STATEMENT:

It is the objective of this training program to train and qualify well logging personnel in the proper use and handling of radioactive materials, to reduce hazard to other personnel at job sites, as well as to take a leadership role in promoting good health physics practices in order to keep exposure to radioactive materials as low as is reasonably achievable.

The contents of this manual will serve as the basis for the training and will be taught by a State or Federally approved instructor in lecture sessions. This training will consist of no less than 16 hours of classroom instruction. If additional materials or training aids are presented, they will be referenced in the training files. The individual must pass a written examination (see example at rear of manual) with a minimum grade of 70. A certificate will be issued to each individual who successfully completes the training. In lieu of this in-house training, an individual may present proof (certificate and/or test) that he has received equivalent radiation safety training in a course approved by the State or Federal Agency for control of radiation.

In addition to the Radiation Safety Course described above, each individual will read and receive instruction in the rules and regulations appropriate to our radioactive material license, and our Operating & Emergency Procedures Manual. The individual will receive on-the-job training under the personal supervision of a logging supervisor, in the use of sources of radiation and/or tracer materials, related handling tools, and radiation survey instruments which will be used in his work assignment. This training under supervision will be at least 8 hours actual handling time and 90 days on-the-job. If this training was received under another company's employ, we will obtain a signed resume of experience from the individual.

After the individual has successfully completed and demonstrated his understanding and competence in the areas above described, the Radiation Safety Officer, under the authority of the license, will designate the individual as a radiation handler. Records to support each individual's qualifications as a radiation handler will be maintained in the radiation training files.

The Radiation Safety Officer will review the information in this training manual and the Operating and Emergency Procedures manual with each new employee (including ancillary employees), and will review the information annually thereafter with the employees to make them aware of the radiation hazard associated with our operations.