

030-20004  
L4L 20628  
03/20

<p>NRC Form 313 I (12-81) 10 CFR 30</p> <p style="text-align: center;">U.S. NUCLEAR REGULATORY COMMISSION</p> <p style="text-align: center;"><b>APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL</b></p> <p><i>See attached instructions for details.</i></p> <p><i>Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.</i></p>		<p><b>1 APPLICATION FOR:</b> (Check and/or complete as appropriate)</p> <p><input checked="" type="checkbox"/> a. NEW LICENSE</p> <p><input type="checkbox"/> b. AMENDMENT TO LICENSE NUMBER</p> <p><input type="checkbox"/> c. RENEWAL OF LICENSE NUMBER</p>																															
<p><b>2. APPLICANT'S NAME</b> (Institution, firm, person, etc.)</p> <p><u>Instrument Control Service</u></p> <p>TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION <u>205-479-6535</u></p>		<p><b>3. NAME AND TITLE OF PERSON TO BE CONTACTED</b> REGARDING THIS APPLICATION</p> <p><u>Richard McConnell</u></p> <p>TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION <u>205-479-6535</u></p>																															
<p><b>4. APPLICANT'S MAILING ADDRESS</b> (Include Zip Code) (Address to which NRC correspondence, notices, bulletins, etc., should be sent.)</p> <p><u>4008 Dauphin Island Pkwy. Mobile, Al. 36605</u></p>		<p><b>5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED</b> (Include Zip Code)</p> <p><u>Scott Paper Co. Front Market St. Chester, Pa. 19013</u></p>																															
(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)																																	
<p><b>6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL</b> (See Items 16 and 17 for required training and experience of each individual named below)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:5%;">LINE</th> <th style="width:45%;">FULL NAME</th> <th style="width:50%;">TITLE</th> </tr> </thead> <tbody> <tr> <td>a.</td> <td>Harry Bryant</td> <td>Service Technician</td> </tr> <tr> <td>b.</td> <td></td> <td></td> </tr> <tr> <td>c.</td> <td></td> <td></td> </tr> </tbody> </table>				LINE	FULL NAME	TITLE	a.	Harry Bryant	Service Technician	b.			c.																				
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<p><b>7. RADIATION PROTECTION OFFICER</b></p> <p><u>Harry Bryant</u></p> <p>Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.</p>																																	
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RECEIVED BY LFMB

Date: 8/8/83

Log: Aug 1 II

By: Brown

Orig. To: 8/16/83

Action Compl. 8/16/83

Applicant: 4566

Check No.: 1110-3L

Amount: Application

Type of Fee: 8/18/83

Date Check Rec'd: 8/18/83

Received By: Brown

## 9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	Sealed Source-Sentrol Beta Gauge	American Atomics	40057-D
(2)			
(3)			
(4)			

## 10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	GM Survey Meter	Victoreen	493-1	1	Beta	0-0.5/MR/HR 0-5 /MR/HR 0-50 /MR/HR
(2)						
(3)						
(4)						

## 11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☒ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

Gulf Nuclear, Inc.  
202 Medical Center Blvd.  
Webster, Tx. 77598

☐ b. CALIBRATED BY APPLICANT

Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

## 12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input checked="" type="checkbox"/> (1) FILM BADGE	Eberline P.O. Box 2108 Santa Fe, New Mexico 87501	<input checked="" type="checkbox"/> MONTHLY
<input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD)		<input type="checkbox"/> QUARTERLY
<input checked="" type="checkbox"/> (3) OTHER (Specify): <u>Finger Badge</u>		<input type="checkbox"/> OTHER (Specify): _____

## 13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)

- ☒ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.  
☐ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.  
☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.  
☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

## 14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

Sources returned to system manufacturer who manage disposal -  
Sentrol, Inc.

# INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. RADIATION PROTECTION PROGRAM. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
16. FORMAL TRAINING IN RADIATION SAFETY. Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
  - a. Principles and practices of radiation protection.
  - b. Radioactivity measurement standardization and monitoring techniques and instruments.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.
  - d. Biological effects of radiation.
17. EXPERIENCE. Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

## 18. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our 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.

a. LICENSE FEE REQUIRED  
(See Section 170.31, 10 CFR 170)

\$110.00

(1) LICENSE FEE CATEGORY:

(2) LICENSE FEE ENCLOSED: \$ 110.00

b. CERTIFYING OFFICIAL (Signature)

c. NAME (Type or print)

Richard McConnell

d. TITLE

Manager Services

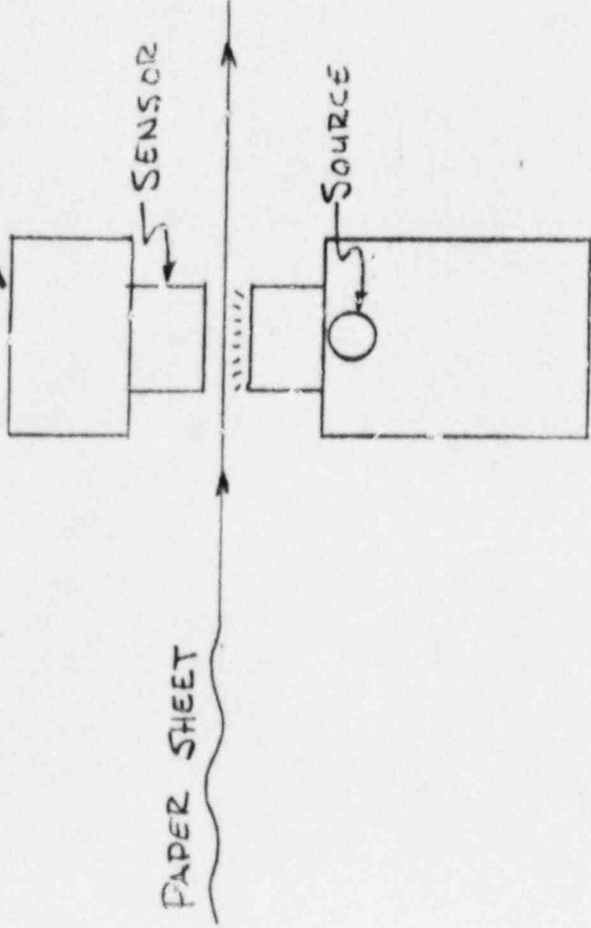
e. DATE

July 25, 1983

ITEM #13

PAPER MACHINE

"O" FRAME TRAVELS BACK  
& FORTH AS PAPER SHEET  
MOVES OVER TRACK



15. See Attachment 001

INDEX

1. FILM BADGE SERVICE
2. PROCEDURES FOR THE SAFE HANDLING OF SEALED RADIOACTIVE SOURCES
3. SHIPPING REGULATIONS
4. SURVEY INSTRUMENTS
5. SOURCE INSPECTION PROCEDURE



Our film badge service will be administered by Eberline Instrument Corporation and their operating procedures should be followed at all times. Eberline does not re-assign badge numbers previously used by personnel so that whenever new personnel are added to the film badge service, a new badge number will be issued.

A control badge is supplied at no charge. This control badge, which is kept in Chester must be stored in an area well away from any source of radiation. It must be returned with the used personnel badges for reading each month.

### 1.1 Internal Procedures

1. Film badges, when received from Eberline each month, will be logged in on ICS's Control List with the data in the EIC Rec. space. These badges should then be mailed to the appropriate field personnel as soon as possible.
2. As soon as a new badge is received by field personnel, the used badge should be returned to ICS in the container in which the new badge was shipped. Used badges are logged in when received in Chester. Badges will be returned by ICS to Eberline on the 15th of the following month so that all field personnel should endeavor to return their used badge before this date.
3. Personnel whose badges have not been returned by the 10th of the following month will be sent a late letter and the Service Manager will be notified.
4. Changes in the film badge service will be made only by the Radiation Safety Officer. Any additions to or deletions from the film badge list should be made on the Eberline change of status form.
5. Two copies of the exposure report are received each month. One copy should be posted on the bulletin board as required by licensing regulations, the second copy should be given to the Radiation Safety Officer for review. Any employee whose film badge shows an excessive exposure will receive written notification of this over-exposure. Any employee may at any time request a written copy of his exposure record.

## 1.2 Film Badge Use

Field service personnel must wear film badges at all times when working in the vicinity of a radioactive source. In practice this means whenever work is being performed on the Betameter, on the source housing when the source is loaded or unloaded, or when a radioactive source is being packaged or shipped. The badge should not be worn when medical or dental x-rays are being taken.

The film badge should be clipped to some external piece of clothing so that it remains at a fixed distance from the body. It should not be attached to articles of clothing which can flap with body movement, such as the tip of a shirt collar or a tie. The film badge must be attached to a shirt or coat pocket or on a belt so that the badge is looking at the source of radiation while work is being performed on the source.

When a source is being loaded into a gauge or when a source has to be replaced, or at any time when there is the possibility of the extremities-normally the hands-receiving a larger radiation dose, finger badges must be worn. As there is normally adequate advance notice when this type of work is to be done, the finger badges must be ordered from the Atlanta office so that they are available when the work is to be performed. Upon completion of the work, the finger badges must be returned to the I.C.S. office so that they can be returned to Eberline for reading.

When not being worn, the film badge should be stored in a safe place. It should never be stored in the vicinity of a radioactive source or any device which could produce a higher than normal background. It should not be subjected to high temperatures or chemical fumes which could cause erroneous readings.



PROCEDURES FOR THE SAFE HANDLING OF  
SEALED RADIOACTIVE SOURCES.

2.1 Receiving and Storing of Sealed Sources

All radioactive sealed sources shipped by Sentrol are packaged so that they may be shipped using a Yellow II label. This means that the activity at the surface of the package will be no greater than 50 mrem/hr., and at a distance of 3 feet it will be no greater than 1.0 mrem/hr. Packages are normally delivered directly to the mill by the carrier but sometimes must be picked up at the local airport. When this is necessary, the package should be stored in the trunk of the car and transported directly to the mill. After normal receiving procedures are completed, the box should be taken to the Sentrol room in the mill for unpacking or storage. Only if the source is to be immediately installed in the source housing of the Betameter should it be removed from the shipping container.

If the source is to be stored, it must be secured against unauthorized removal from the storage place and must not be stored in the same facilities with materials which might substantially increase the fire or explosion hazard of the storage space and its radioactive contents. Normally, an unused space in the Sentrol room meets all these requirements.

**NOTE** Do not leave film badges closer than 6 feet from the source package when using this room.

2.2 Unpacking and Installing the Radioactive Source in the Source Housing

When the source is to be installed in the Betameter sensor, use the following procedure:

1. Ensure the proper tools are available:

Safety Glasses (Mandatory)  
Rubber Gloves (Optional)  
Handling Tongs (Optional)  
Victoreen Survey Meter Model 470A

2. Safety glasses must be worn. Rubber gloves will reduce Beta radiation on the hands, and tongs will increase the distance between the source and the hands. The last two will make handling the source more difficult, increasing handling time and increasing the possibility of dropping the source.

3. Before the package containing the radioactive source is opened, it must be inspected to ensure that the shielding material has not changed during transport. For this purpose, a special radiation survey meter capable of measuring beta dose rates must be used. The survey meter to be used by ICS to make this measurement is a Victoreen 470A Survey meter.
4. If the radiation from the package appears normal (with a Yellow II label this means less than 50 mr/hr at the surface of the box), the cardboard box containing the source should be opened and the one gallon paint can in which the source is sealed should be removed.
5. With the can sitting on the bench, the lid may be pried off and the lead-wrapped source removed. With the lid removed from the can, check that there is no significant beta radiation, the presence of which would indicate that the shielding has moved during transport. If there is a large amount of beta radiation it means that the source is no longer properly capped and special precautionary measures must be taken. If all appears normal, the source with its lead shielding may ~~not~~ <sup>now</sup> be removed from the can.
6. To check for leakage from the source during shipping, the one gallon paint can should be checked for radio activity, if the source is Krypton 85. (The Krypton will remain in the bottom of the can if it has leaked). ?

### 2.3 Source Loading and Installation

These instructions are intended to cover all of the Betameters which are on site. These are the specific Sentrol Models on site.

GAUGE MODELSEALED SOURCE MODEL, ISOTOPE AND  
QUANTITY CONTAINED IN SOURCE

TB-1 *Spec* AAC 40057B or  
AAC 40057D Krypton 85 500 millicuries

✓ BG-III *Gen* AAC 40057B or  
AAC 40057D Krypton 85 500 Millicuries

Profilograph Models  
5001 and 5002 *Gen* AAC 40057B or  
AAC 40057D Krypton 85 500 Millicuries

and the following Electronic Automation Systems, Inc. Models:

GAUGE MODELSEALED SOURCE MODEL, ISOTOPE AND  
QUANTITY CONTAINED IN SOURCE

Mark II O-Frame AAC 40057, 40057B  
Mark II C-Frame 40057D, 40092A/3, or  
40092A/12; 3M  
3E4L or 3E4S; or  
USRC LAB-323A Krypton 85 500 Millicuries

Basis Wt. 3M 3E4S or  
Profilograph  
Mark II SS USRC LAB-323A Krypton 85 500 Millicuries

- b) There are three types of source housing assemblies which are used on these different models of the Betameter. The latest version is the Model BGIII which is used in the Betameter III, the Profilograph Models 5001 and 5002, and which will be used on all of our new systems. The second type of housing is the one used on the Sentrol Model TB-1. The third is used on all Models of the EAS Betameter.

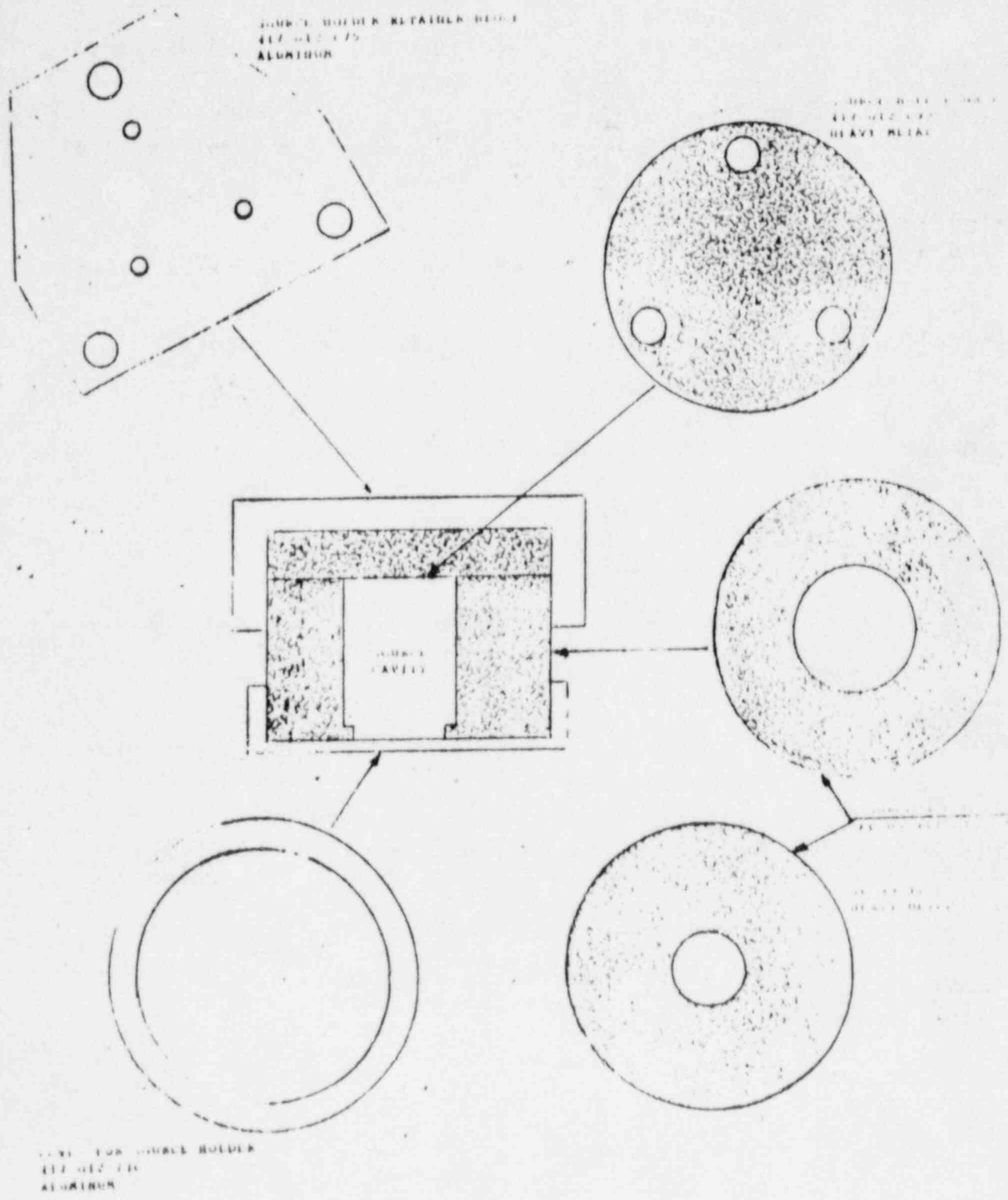


Figure 1 BETAMETER MODEL BC 111  
SOURCE MOUNTING AND REMOVAL

NOTE: Be extremely careful when you are handling radioactive sources. If the source is accidentally damaged during handling, notify the Radiation Safety Officer immediately. Handle the source in an area where no other people are working. If you have any questions concerning the installation of sources, please ask for further advice.

During all source handling procedures, protective handwear (rubber or plastic gloves) should be used to avoid contamination. Immediately following the procedure, gloves should be removed and cleaned. Hands should then be washed thoroughly to eliminate any possible contamination.

### 3.1 Mounting of Source in Source Holder Assembly<sup>11</sup>

(See figure 1)

1. Place source holder cover upside down on a flat surface. This aluminum cap (417 012 736) is provided to minimize beta-ray radiation levels during the transport or storage of the source assembly.
2. Place source holder block (417 012 691, Kr85; 417 012 657 Sr 90) face down in the aluminum cap.
3. Remove the source from its present container and place in source holder block with radiation face pointing into the holder block and aluminum cap. At all times during this step, keep the radiation face of the source pointed away from persons in the vicinity. Also make sure that the source is not pointed at any part of the body of the source handler.
4. Place source holder base (417 012 690) over source and source holder. Assemble using three #4-40 x 5/8" flat head stainless steel screws.
5. Place source holder retainer block (417 012 675) over the source holder assembly. Place #6-32 x 3/4" stainless steel socket head screws with bolt seals (318 005 045, bolt seal Parker #600-3115) in assembly and tighten moderately.
6. The source holder is now ready for assembly into the main housing block (417 012 676) of the Betameter source unit.



### 3.2 Mounting of Source Holder Assembly Into Main Housing Block

(See Figure 1.)

1. Apply thin film of vacuum grease to O-ring (O-ring Parker 2-031-5). Make sure ring is free from dust and dirt before applying grease. If grease is not available, ensure that O-ring is clean and proceed to next step.
2. Place O-ring into groove in main housing block (417 012 676). Make sure ring is not twisted.
3. The entire source holder assembly may now be lifted out of the aluminum cap and placed into the main housing. At all times, keep the source pointed away from people in the vicinity. Also make sure that the source is not pointed at any part of the body of the source handler.
4. Insert stainless steel #10-32 x 1 3/8" socket head screws and tighten evenly to a moderate degree.
5. With the source properly installed in the housing, the source shutter mechanism should be checked for correct operation. Make sure that no one is exposed to the beta beam when the shutter is open.
6. Before installing the source housing on the Scanner, make sure that the correct information is on the radioactive labels and that the labels are properly secured.

### 3.3 Removal of Source Holder Assembly from Main Housing Block

(See Figure 1.)

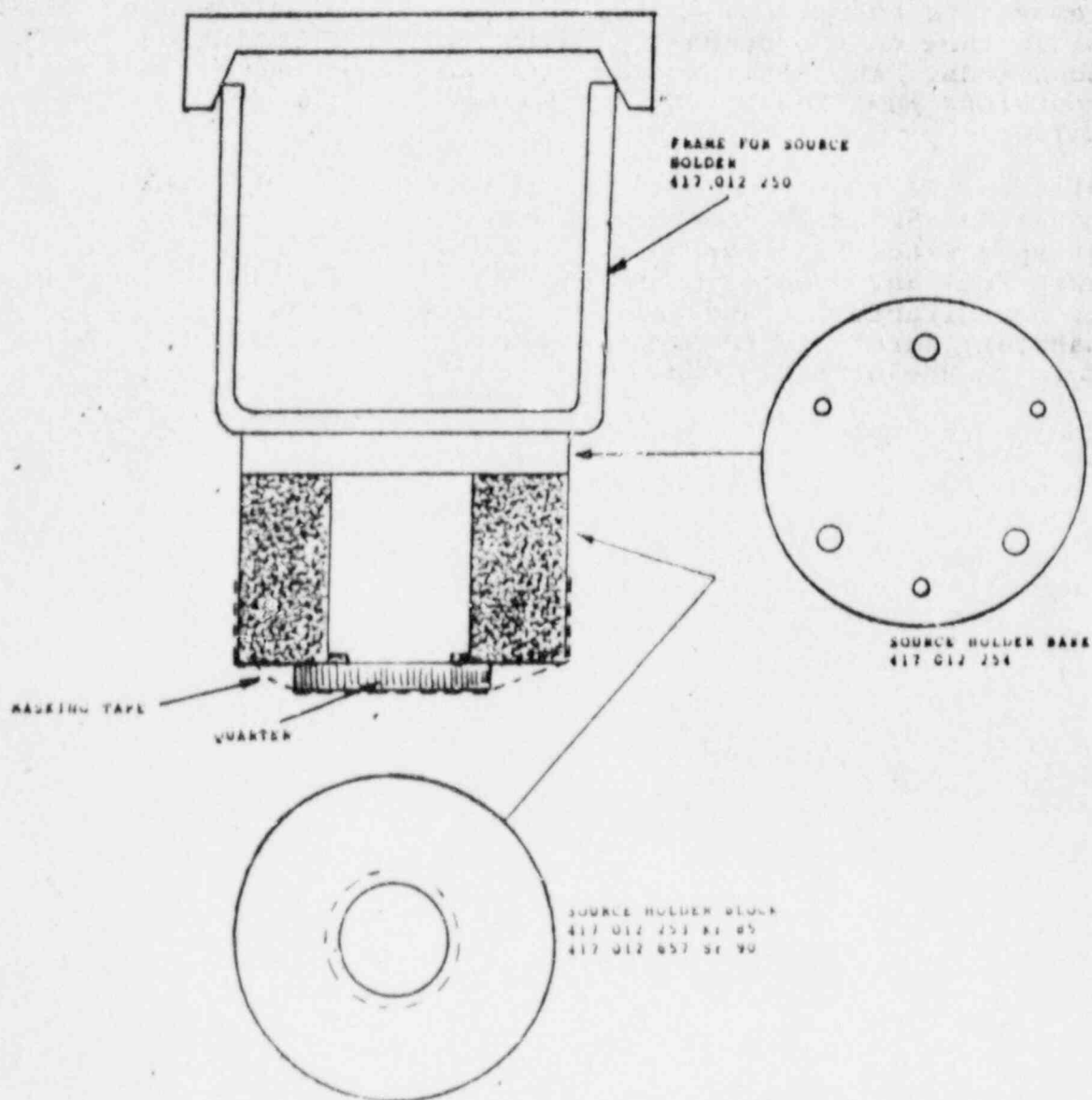
1. Place source holder cover (417 012 736) upside down on a flat surface.
2. Remove the outermost hexagonal cap screws on the source holder retaining block (417 012 675) perimeter.
3. The source holder assembly may now be lifted out of the main housing block. Keep the source pointed downwards and away from any part of persons in the vicinity.
4. Place the source holder assembly into the aluminum cap with the radiation face directed into the cap.
5. The assembly with the aluminum cap may now be safely set aside or transported to another area.

### 3.4 Removal of Source From Source Holder Assembly

(See Figure 1)

1. Remove remaining bolts from source holder retaining block.
2. Remove retaining block by pulling vertically.
3. Remove screws from source holder base and remove source holder base.
4. If the source holder is sitting in the aluminum cap, remove the holder and source assembly from the cap and place them on the bench top, with the source pointing downwards. The aluminum cap will now serve as the source container when the source is removed from the source holder.
5. Pick up the source holder in one hand and slowly rotate to slide the source out just enough so that it may be grasped with the other hand. Keeping the source pointed away from any people in the vicinity and ensuring that it is not directed at any part of the body of the source handler, carefully remove the source and place it face down in the aluminum cap.
6. The source should now be removed from the source housing aluminum cap and placed in its regular shipping aluminum cap and the locking screw tightened.

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**Figure 2** BETAMETER MODEL TB1  
SOURCE MOUNTING AND REMOVAL

#### 4.1 Mounting of Source in Source Holder Assembly

(See Figure 2.)

1. As no aluminum source holder cover is provided with this assembly, tape a quarter over the beta emission hole in the source block, using masking tape.
2. Place source holder block (417 012 253, Kr 84; 417 012 657, Sr 90) face down on the bench.
3. Remove the source from its present container and place it in the source holder block with radiation face pointing into the holder block and the quarter. At all times during this step, keep the radiation face of the source pointed away from persons in the vicinity. Also make sure that the source is not pointed at any part of the body of the source handler.
4. Place source holder base (417 012 254) over source and source holder. Assemble using three #4-40 x 5/8" flat head stainless steel screws.
5. The source holder is now ready for assembly into the main housing frame (417 012 250) of the Betameter source unit.

#### 4.2 Mounting of Source Holder Assembly Onto Main Housing

(See Figure 2.)

1. Lay the source shutter mechanism on one side with the source shutter held in the open position. The source shutter should be on the upper side. This will expose the frame (417 012 250) on which the source block is mounted.
2. The source holder assembly may now be located on the frame. At all times keep the source pointed away from people in the vicinity. Also make sure that the source is not pointed at any part of the body of the source handler.
3. Insert stainless steel #4-40 x 1 3/8" socket head screws and tighten evenly to a moderate degree.
4. Remove the taped-on quarter by loosening the tape on the bottom side then on the top side and lifting the quarter clear.

5. Close source shutter.
6. Slide complete source shutter mechanism into source housing and tighten the three countersunk #1/4 x 28 3/8 inch bolts.
7. With the source properly installed in the housing, the source shutter mechanism should be checked for correct operation. Make sure that no one is exposed to the beta beam when the shutter is open.
8. Before installing the source housing on the Scanner, make sure that the correct information is on the radioactive labels and that the labels are properly secured.

#### 4.3 Removal of Source Holder Assembly From Main Housing Block

(See Figure 2.)

1. Remove the three #1/4 x 28 3/8 inch bolts which secure the shutter assembly to the source housing, and remove the shutter assembly from the housing.
2. Lay the source shutter mechanism down on a bench so that the source beam points away from the body and the shutter will rotate to the upper side when opened.
3. Remove the #4 x 40 screws holding the source block to the frame (417 012 250).
4. Use one hand to hold the source block and, with the other, open the shutter. Take care that neither hand is exposed to the beta beam.
5. Remove source block and lay face down on the bench so that the beam points into the table top.

#### 4.4 Removal of Source From Source Holder Assembly

(See Figure 2.)

1. Remove screws from source holder base and remove source holder base.
2. Locate the aluminum shipping cap so that the source may be dropped in after removal from the block.



3. Remove the source from the source block using a screwdriver with something which will stick to the back of the source (gum or tape) attached to the tip of the blade.
4. Drop the source into the aluminum shipping cap and tighten the setscrew.

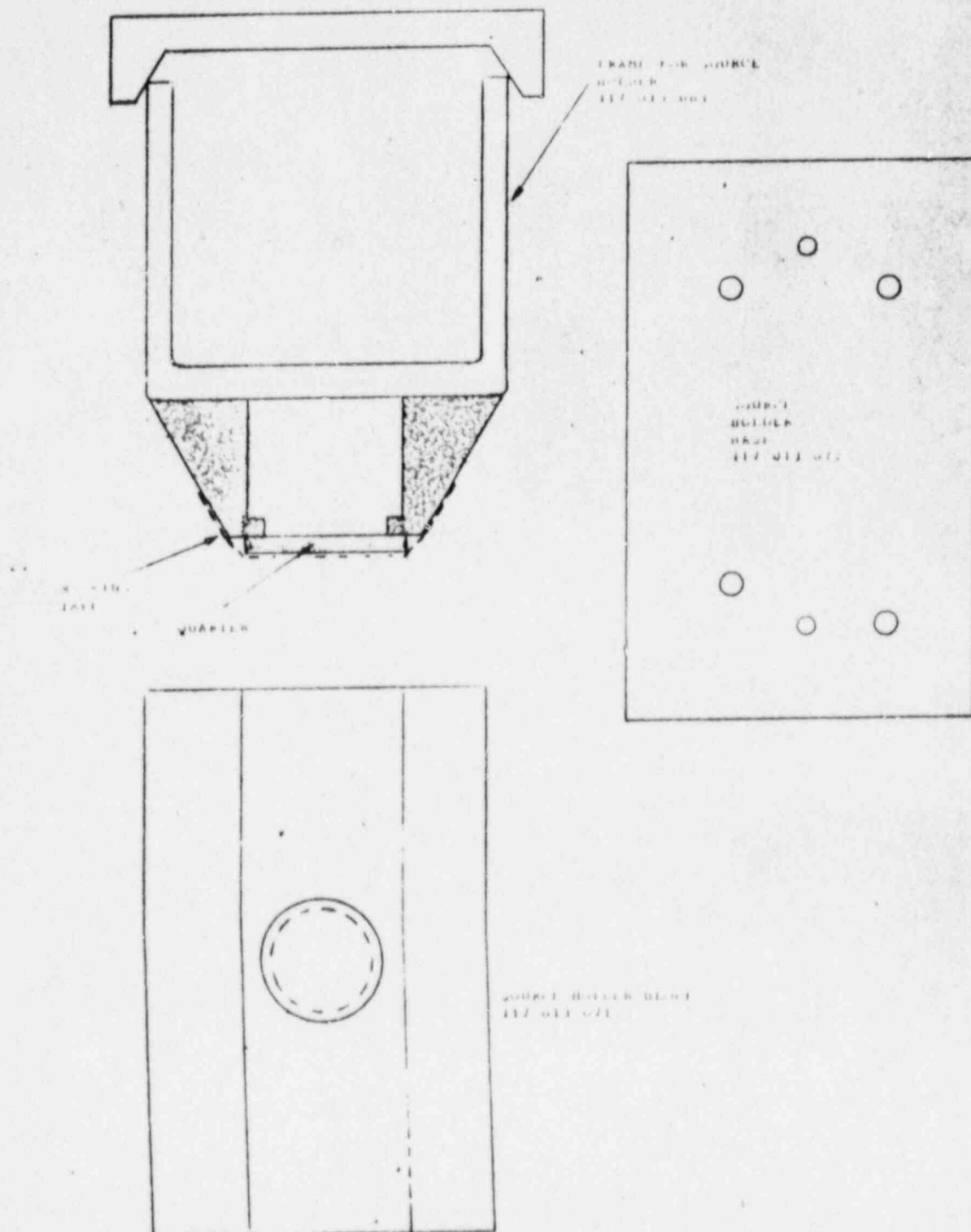


Figure 3 BETAMETER EAS MK II O- & C-FRAME  
( & EAS BASIS WT. PROFILOGRAPH)

SOURCE MOUNTING AND REMOVAL

### 5.1 Mounting of Source in Source Holder Assembly

(See Figure 3.)

1. As no aluminum source holder cover is provided with this assembly, tape a quarter over the emission hole in the source block, using masking tape.
2. Place source holder block (417 013 071) face down on the bench.
3. Remove the source from its present container and place it in the source holder block with radiation face pointing into the holder block and the quarter. At all times during this step, keep the radiation face of the source pointed away from persons in the vicinity. Also, make sure that the source is not pointed at any part of the body of the source handler.
4. Place source holder base (417 013 072) over source and source holder. NOTE: It may be necessary to insert a small amount of packing material between the back face of the source and the source holder base to make sure that the source is held tightly in the source block. Assemble using two #4-40 x 5/8" flat head stainless steel screws.
5. The source holder is now ready for assembly into the main housing frame (417 013 084) of the Betameter source unit.

### 5.2 Mounting of Source Holder Assembly Onto Main Housing

(See Figure 3.)

1. Lay the source shutter mechanism on one side with the source shutter held in the open position. The source shutter should be on the upper side. This will expose the frame (417 013 084) on which the source block is mounted.
2. The source holder assembly may now be located on the frame. At all times, keep the source pointed away from people in the vicinity. Also make sure that the source is not pointed at any part of the body of the source handler.
3. Insert stainless steel 8 x 32 3/4 socket head screws and tighten evenly to a moderate degree.

4. Remove the taped-on quarter by loosening the tape on the bottom side then on the top side and lifting the quarter clear.
5. Close source shutter.
6. Slide complete source shutter mechanism into source housing and tighten the three countersunk #14 x 28 3/8 inch bolts.
7. With the source properly installed in the housing, the source shutter mechanism should be checked for correct operation. Make sure that no one is exposed to the beta beam when the shutter is open.
8. Before installing the source housing on the scanner, make sure that the correct information is on the radioactive labels and that the labels are properly secured.

### 5.3 Removal of Source Holder Assembly From Main Housing Block

(See Figure 3.)

1. Remove the three #1/4 x 28 3/8 inch bolts which attach the shutter assembly to the source housing and remove the shutter assembly from the housing.
2. Lay the source shutter mechanism down on a bench so that the source beam points away from the body and the shutter will rotate to the upper side when opened.
3. Remove the 8 x 32 screws holding the source block to the frame (417 013 084).
4. Use one hand to hold the source block and, with the other, open the shutter. Take care that neither hand is exposed to the beta beam.
5. Remove source block and lay face down on the bench so that the beam points into the table top.

### 5.4 Removal of Source From Source Holder Assembly

(See Figure 3.)

1. Remove screws from source holder base and remove source holder base.

2. Locate the aluminum shipping cap so that the source may be dropped in after removal from the block.
3. Remove the source from the source block using a screwdriver with something which will stick to the back of the source (gum or tape) attached to the tip of the blade.
4. Drop the source into the aluminum shipping cap and tighten the setscrew.



PACKAGING AND SHIPPING THE SOURCE

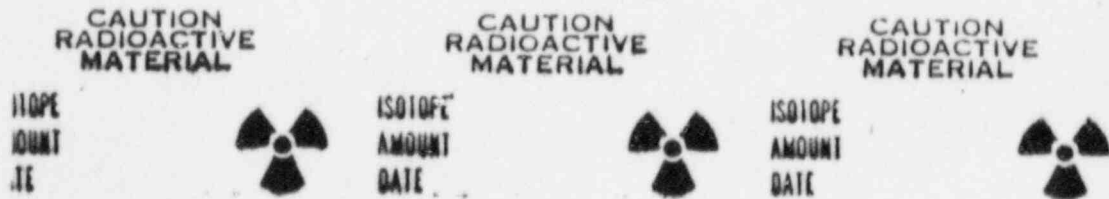
1. All sources which are removed from Sentrol's Betameters must be returned to Sentrol Systems, Inc. in Atlanta for disposal or safe storage.
2. To properly package the source, a source disposal kit must be obtained from Atlanta. The kit contains:
  1. 1/16 inch lead sheet 24" x 3"
  2. 1/16 inch lead plugs
  3. 1 One gallon paint can with stick-on radioactivity label.
  4. 2 Yellow II radioactivity labels
  5. Shipper's certificate for Radioactive Materials.

These will be shipped in an approved cardboard box which is also used to return the source to Atlanta.

3. Roll the source and its aluminum cap in the 24-inch lead strip and secure the roll with masking tape. Plug the ends of the roll with the 1/16 inch lead plugs and secure with masking tape.
4. Using any suitable packing material, locate the source and its lead shield in the center of the one gallon paint can and seal with the lid. Mark the pre-stuck label on the can with the type and activity of the source.
5. The one gallon paint can should now be centered in the cardboard container and the package sealed. To ensure that the package is correctly labeled, read "Shipping Regulations", Section 7.

Figure 4

LABELS FOR SHIPMENT OF RADIOACTIVE MATERIALS



TAPES AND STICKERS



SHIPPING REGULATIONS

A brief summary of packaging and labeling requirements are as follows:

1. The box must carry one of the following labels:

White I  
Yellow II  
Yellow III

- a) White I label - used when the reading at the surface of the package is less than 0.5 mrem/hour.

Yellow II label - used when the reading at the surface exceeds 0.5 mrem/hour, but is less than 50 mrem/hour. The reading at 3 feet must be less than 1.0 mrem/hour.

Yellow III label - used when the reading at the surface exceeds 50 mrem/hour, but is less than 200 mrem/hour at the surface of the container. The reading at 3 feet must be less than 10 mrem/hour.

Most shipments to and from mills will involve the Yellow II label as shown in Figure 4. Various identification stickers and warning tapes are also available as shown.

- b) All labels contain blanks for:

- 1) "Contents" - what radioisotope (example Sr<sup>90</sup>)
- 2) "No. of Curies" - self-explanatory

- c) Yellow II and Yellow III have a box for the "Transport Index". This is the reading in mrem/hour at 3 feet from the surface of the package.

2. The box must be stenciled with a DOT specification. USA DOT 7A Type A Radioactive Materials.
3. A Shipper's Certification for Radioactive Materials. This form must be filled out and signed. Three copies are required. One must be attached to the outside of the package, the other two copies accompany the shipping papers (See examples, Figures 5 and 6.)
4. A packing slip attached externally so that the box does not need to be opened for inspection.
5. The box should be marked or stenciled with one of the following:
  - a) "Special Form"
  - b) "Normal Form"
  - c) "N.O.S." (not otherwise specified)

# SHIPPER'S CERTIFICATION FOR RADIOACTIVE MATERIALS

Figure 5

NO OF PKGS	SHIPPING NAME <small>PROPER SHIPPING NAME AS SHOWN IN SECTION 172.5, TITLE 49, CODE OF FEDERAL REGULATIONS 49 CFR. SPECIFY EACH ARTICLE SEPARATELY</small>	RADIO NUCLIDE <small>NAME OF PRINCIPAL RADIOACTIVE CONTENT (49 CFR 173.250)</small>	GROUP <small>TRANSPORT GROUP NUMBER (49 CFR 173.200)</small>	FORM <small>Either Chemical Form, Shipped, Gas, or Liquid, or Solid, or Special Form, or Special Enrichment</small>	ACTIVITY <small>NUMBER OF CURIES</small>	LABEL <small>WHITE - I or YELLOW - II or YELLOW - III</small>	TRANSPORT INDEX <small>FOR YELLOW LABELS ONLY</small>	TYPE <small>TYPE A or TYPE B</small>
	RADIOACTIVE MATERIAL  Special Form          CARGO-ONLY AIRCRAFT	Kr 85	III	Gas Special Form	0.5	Yellow II	1.0	Type A

This is to certify that the above-named articles are properly classified, described, packaged, marked, and labeled; that they meet the content and quantity requirements of the Federal Aviation Regulations, Part 103, and Title 49, Code of Federal Regulations, Part 170-189; and are in proper condition for air transportation according to applicable regulations of the carrier and the Department of Transportation. This consignment is within the limitations prescribed for: (MARK ONE)

☐ BOTH PASSENGER AND CARGO AIRCRAFT

☒ CARGO-ONLY AIRCRAFT

NAME & ADDRESS OF SHIPPER

NAME & TITLE OF PERSON SIGNING CERTIFICATION

Sentrol Systems, Inc.  
your address

DATE

SIGNATURE

"Special form radioactive materials" means those which, if released from a package, might present some direct radiation hazard but would present little hazard due to radiotoxicity and little possibility of contamination. This may be the result of inherent properties of the material (such as metals or alloys) or acquired characteristics, as through encapsulation.

"Normal form radioactive material" means those which are not special form radioactive materials.



THE SMALL FALCON AIRLINE

Figure 6

NO OF PKGS	SHIPPING NAME	RADIO NUCLIDE	GROUP	FORM	ACTIVITY	LABEL	TRANSPORT INDEX	TYPE
	PROPER SHIPPING NAME AS SHOWN IN SECTION 172.5, TITLE 49, CODE OF FEDERAL REGULATIONS (49 CFR). SPECIFY EACH ARTICLE SEPARATELY.	NAME OF PRINCIPAL RADIOACTIVE CONTENT (49 CFR 173.890)	TRANSPORT GROUP NUMBER (49 CFR 173.200)	Either Chemical Form Plus Gas, or Liq., or Solid, or Special Form, or Special Encapsulation	NUMBER OF CURIES	WHITE - I or YELLOW - II or YELLOW - III	FOR YELLOW LABELS ONLY	TYPE A OR TYPE B
	RADIOACTIVE MATERIAL  Special Form       CARGO-ONLY AIRCRAFT	Sr <sup>-90</sup>	II	Special Form	0.02	Yellow II	1.0	Type A

This is to certify that the above-named articles are properly classified, described, packaged, marked, and labeled; that they meet the content and quantity requirements of the Federal Aviation Regulations, Part 103, and Title 49, Code of Federal Regulations, Part 170-189; and are in proper condition for air transportation according to applicable regulations of the carrier and the Department of Transportation. This consignment is within the limitations prescribed for: (MARK ONE)

( ) BOTH PASSENGER AND CARGO AIRCRAFT

NAME &amp; ADDRESS OF SHIPPER

Sentrol Systems, Inc.

your address

DATE \_\_\_\_\_

~~IX~~ CARGO-ONLY AIRCRAFT

NAME &amp; TITLE OF PERSON SIGNING CERTIFICATION

SIGNATURE

## 8.0 SURVEY INSTRUMENTS

Three types of survey meters are used by Sentrol for both source-wipe checking and radiation surveys. They are:

1. Victoreen Model 470A
2. Eberline Model 120
3. EA Model 148

The Victoreen Model 470A uses an unsealed air ionization chamber and is capable of measuring beta radiation levels as well as penetrating radiation levels. It must be used whenever a package containing a radioactive beta source is to be shipped or has been received for installation in a Betameter or Profilograph. The package must have the radiation levels at the surface of the package read, and a record of these measurements must be maintained, with a copy forwarded to the Radiation Safety Officer.

Both the Eberline Model 120 and the EA Model 148 have a thin-window geiger counter which is used to check for beta activity during a source-wipe check. The instruments are not calibrated with the beta counters connected, so that field surveys should not be made when the beta counter is used.

Sentrol uses two types of radioactive sources, Krypton 85 and Strontium 90. Because Krypton 85 is a gas the source is not wipe-tested, so the only time that the survey counter is used with a beta probe is in checking the source-wipe when a Strontium 90 source is checked. There are no Strontium 90 sources on this site.

### 8.1 Recalibration

To ensure that there are at all times an adequate supply of properly calibrated survey instruments, the following procedure will be adopted in Chester. One of the survey meters will be calibrated in January and one in February. Each meter will then be recalibrated on a three month interval from the initial calibration as called for by regulation. This will mean that we will have a sufficient number of properly calibrated instruments at all times.

## 9.0 SOURCE INSPECTION PROCEDURES

### 9.1 Materials Required for Source Inspection

1. Film Badge
2. Rubber Gloves
3. Safety Glasses
4. Alcohol
5. Cotton Swabs
6. Geiger Counter with beta detector
7. Source Report Envelope
8. Plastic Bag
9. Plastic Sheet
10. Mirror
11. Plexiglass Sheet

### 9.2 Source Inspection & Source-Wipe

1. Determine if source is a sealed gas type or a solid type.
2. If it is a sealed gas type, a shutter inspection is all that is required. (Shutter inspection means verifying that the shutter is functioning electrically and mechanically).
3. If the source is solid, follow steps "a" through "f".
  - a) Turn source shutter to "OFF".
  - b) Don protective gear (safety glasses, gloves, film, and finger badges).
  - c) Moisten CLEAN swabs in alcohol.
  - d) Swab the entire exterior source window area.
  - e) Check each swab for contamination. Make sure you are well away from the area of the source so that the counter reads the swabs only.
  - f) If there is no apparent leakage, place the swabs into the Source Report Envelope and return them to

Atlanta, Ga., or Downsview, Ontario, whichever is applicable, as soon as possible. Be sure to enter all necessary information on the envelope.

### 9.3 Source Leakage - Procedure

If, for any reason, a source is suspected of leaking, proceed as follows:

1. Remove suspected unit to a room that can easily be closed off and sealed, if necessary. Turn off ventilating system during wipe test.
2. Place the unit on the plastic sheet.
3. Carefully remove source assembly from housing.
4. As soon as source can be wiped with a swab dampened in alcohol, do so.
5. Hand the swab to a co-worker outside the room. Have him take a reading on the swab. If a reading is apparent, have the room sealed off.
6. Leave the room and, just outside the door, have your co-worker monitor you and your clothing. If the clothes show a reading, remove them and place them in a plastic bag that can be sealed. Go immediately to a shower and wash your entire body. While you are de-contaminating yourself in the shower, have your co-worker call for further information.
7. Make sure that NO ONE enters the contaminated room.
8. Be sure to call the ICS Radiation Officer immediately.

- 9.4 Surveys of each sealed source will be performed at intervals not to exceed six (6) months. These surveys will strictly adhere to the regulations by the U.S. Nuclear Regulatory Commission. A copy of the NRC regulations shall be on the site at all times.

The results of this survey shall be maintained as specified in the NRC regulations. A report of all findings will be submitted to the customer. The report will give source location, survey reading, date and next scheduled inspection date.

16.
  1. U.S. Navy Courses applicable for nuclear submarines.
  2. Sentrol Systems Radiation as per attached certificate.



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*This is to Certify that*

HARRY BRYANT

*has Successfully Completed*

RADIATION COURSE

*held at*

SENTROL TRAINING CENTRE, SEPTEMBER 1979

**sentrol**

President

*[Signature]*

Instructor

*[Signature]*

17. Resume Attached

**EMPLOYMENT HIGHLIGHTS**

**July 1979-Present**  
**SENTROL SYSTEMS, INC.**

**July 1979-May 1981**

Employed as field service representative at company's largest customer site. Charged with maintaining full range of Sentrol products. These included; Varian 620/620L100 based process control system; Varian V72/77 based distributed intelligence system which also included Intel 8080A remote modules; DEC LSI 11/02 based distributed intelligence system. All these systems included a full range of peripheral I/O equipment to provide complete process measurement and control of the paper machines they are installed on.

**May 1981-Nov. 1982**

Promoted to Area Technical Supervisor for eastern Pennsylvania. Responsible for all administrative and technical aspects of the service organization in eastern Pennsylvania. Which included supervising 6 technicians who maintained process control systems for both the company's largest and newest customers.

Interfaced on a regular basis with all customers regarding quality of service provided, handling customer complaints, negotiating service contracts, etc.

Assisted field personnel in performance of their maintenance duties on both electronic and mechanical equipment.

Interfaced with other departments within Sentrol to insure timely completion of on going projects and satisfy all customers.

Directly involved with several projects from initial conception to final delivery and installation.

**Nov. 1982-Present**

Transferred and assumed current position as Area Technical Supervisor responsible for all service in the Midwest U.S. This includes all duties noted above as well as supervision of 8 technical representatives and interfacing with 7 customers.

**July 1971-July 1979**  
**U.S. NAVY**

**1976-1979**

Duty station when honorably discharged was Submarine Headquarters, Norfolk, Va.

Was instrumental in setting up training plan for 85 man communications division.

Provided maintenance of an/wrr-7 computerized submarine broadcast receiver.

Awarded Navy Achievement Medal in recognition of service rendered.

**1972-1976**

Attached to submarine USS Benjamin Franklin in communications division. Promoted from seaman through Radioman 1/c during tour of duty.

Reason Desiring Change: Desire to vary experience as well as increase income.

**REFERENCES**

Available on request

### JOB OBJECTIVE

Position in Supervision or Management of Electronics/Computer field service. Would also accept position as field service technician with opportunity to move into Management.

### EMPLOYMENT

- 1979-Present      AREA TECHNICAL SUPERVISOR  
Sentrol Systems, Inc. (process control systems)  
611 N. Lynndale Dr.  
Appleton, WI.
- 1971-1979      U.S. NAVY. Enlisted as seaman recruit, honorably discharged as Radioman 1/c.

### EDUCATION

- Formal:      Electronic Computer Programming Institute  
Norfolk, VA. (Computer technology)  
Graduated May 1979
- 1971 graduate of Tell City High School  
Tell City, IN.
- Other:      National Radio Institute (Correspondence)  
Washington, D.C. (Communications Electronics)  
Completed July 1975
- Various U.S. Navy service schools which covered from Basic Electronic Theory to advanced Computer Repair.

### PERSONAL

- Born:      October 15, 1953 in Tell City, IN.
- Appearance:      Height 6'; Weight 165 lbs.
- Other:      Held Top Secret security clearance 12/71 - 7/79.

(FOR AMPLIFICATION SEE FOLLOWING)

Address Change

03020004

03225

9/88

LICENSE FEE TRANSMITTAL

1. APPLICATION ATTACHED

Instrument Control Service

7-1-87

107500

01-20628-01

2. FEE ATTACHED

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### 3. COMMENTS

M. Weisenberger

7-9-87

B. LICENSE FEE MANAGEMENT BRANCH

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Only.

2. Correct Fee Paid. Application may be processed for:

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S. Kemherley

9/16/05