

MEMO ROUTE SLIP Form ABC-88 (Rev. May 14, 1947)		See me about this. Note and return.	For concurrence. For signature.	For action. For information.
TO (Name and unit) <i>J.R. Rogers D.L.R.</i>	INITIALS DATE	<input checked="" type="checkbox"/>		
TO (Name and unit)	INITIALS DATE			
TO (Name and unit)	INITIALS DATE			
FROM (Name and unit) <i>R. S. Bondman Isotopes Branch</i>	REMARKS <i>Procedure submitted with application from Isotopes Specialties. Please return.</i>			
PHONE NO.	DATE			

A/44

ISOTOPES SPECIALTIES COMPANY,
INC.

ADMINISTRATIVE PROCEDURES

1. Purchasing
2. Use
3. Storage
4. Waste Disposal
5. Sale
6. Safety Procedures
7. Record System
8. Isotope Committee
9. Emergency Procedures

August 20, 1958

1. Purchasing

- a. All purchases of radioactive material shall be approved by at least one member of the Isotope Committee.
- b. All purchases which involve nuclides not previously possessed or which increase possession quantity of a particular nuclide above previous levels shall be approved by the Isotope Committee.

2. Use

- a. Any quantity of any isotope taken from stock to be made into a labeled compound or tracer, or sealed source, or to be used in research or development within the company, or to irradiate samples, or for any other purpose except shipment to authorized customers shall be taken only on approval of Technical Director or General Manager except as noted in 2b and 2c below.
- b. Industrial tracers of kind and quantity previously handled may be made up by radiochemist on receipt of authorized order without higher authority.
- c. Sealed beta sources of up to 10 mc. and sealed gamma sources up to 100 mc. may be used by persons previously experienced in the given function for usual purposes, e.g. film badge or instrument calibration, without higher authority.
- d. All packing of closed containers or sealed sources shall be done at shipping table.
- e. Other than for counting purposes no open container of radioactive material may be used or transported except in C-14 Lab. and Hot Lab. area.
- f. Any quantity and form of tritium over 100 millicuries taken from stock for incorporation into a labeled compound tracer or sealed source, or for any other purpose except shipment to authorized customers, shall be taken only on the approval of a member of the Isotope Committee. In no cases shall tritium be handled in greater than 100 curie batches.

3. Storage

- a. All radioactive isotopes not excepted in 3b, 3c, and 3d below shall be stored in the underground storage tubes, in the swimming pool facility, or in the large storage shield in the Hot Lab. area.

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- b. C-14, S-35, and H-3 in less than curie quantities may be stored in properly posted storage cabinets or drawers or refrigerator in C-14 lab. Residues or intermediates containing these nuclides may be temporarily stored on bench tops pending further processing or disposal. Multicurie quantities of tritium or tritiated materials which are volatile or which could conceivably exchange with moisture in the atmosphere, shall be stored in sealed ampules or break seals which shall be appropriately labeled and stored in the tritium hood. Quantities of tritium gas exceeding 100 curies will be stored as the uranium hydride or other suitable metal hydride in a sealed container.
- c. Sealed sources may be stored in shipping or use areas in suitable marked containers with sufficient shielding so that radiation 1 foot from container is not more than 6 mr/hr.
- d. Millicurie quantities of solutions which are frequently used may be stored in auxiliary properly marked shields in hood or on bench in Hot Lab. Bottles containing solutions must be capped immediately after each use. Shielding must be such that background is not increased by more than 6 mr/hr at 1 foot from shield.
- e. Submicrocurie level sources used for instrument calibration or other purposes may be stored near place of use out of hot area.
- f. Outgoing radioactive shipments may be left at shipping table from time of packing until time of pickup but not more than 48 hours. Incoming radioactive shipments may be left at shipping table from time of receipt until convenient time for transfer but not more than 48 hours.

4. Waste Disposal

a. Isotopes Specialties Company Waste

- (1) All solid waste materials shall be stored in concrete-lined 55-gallon drums. No small containers (boxes, bottles, cans) which will cause voids in the drums when subsequently filled with cement are to be placed in the drums. Such containers must first be broken or cut. Wastes contaminated with isotopes having half-lives under 30 days are to be segregated when feasible from those having half-lives over 30 days. Running records of the quantities of each isotope placed in drums shall be kept. No single drum is to contain more than 2 curies of radium or polonium or more than 2.7 curies of other long-lived isotopes except by special approval of a member of the Isotope Committee. When drums are full they are to be marked with the totals involved and are to be stored in the waste storage pit. The information is also to be entered in the waste log.
- (2) Liquids which do not contain over 10 uc. of radioisotope (except alpha emitters and Sr-90) may be disposed of via the sewer line with adequate flushing. Disposal of larger quantities and disposal of liquids containing alpha emitters or Sr-90 via the sewer may only be done with prior approval of a member of the Isotope Committee, who will consider each case and determine that it is within the limits established in the Federal Register.

b. Waste received from Customers

- (1) Waste received is to be transferred to concrete shield or to concrete-lined drums in the waste storage pit within 48 hours. No small containers which will cause voids when the drums are subsequently filled with cement are to be placed in the drums. Each transfer is to be recorded in the waste log.
- (2) When a package is received, it is to be monitored for possible leakage and compliance with I.C.C. regulations. Deviations are to be brought to the attention of a member of the Isotopes Committee.
- (3) A standard receipt form is to be made out in duplicate by the person receiving the package, one copy being sent to the customer and one copy being filed. The customer's assay of the contents will be used unless some discrepancy is suspected.

In addition to the above items, the following procedures apply to the pick up of waste by Isotopes Specialties Company personnel in the Los Angeles area:

- (4) Waste material is to be packaged according to I.C.C. regulations, if possible. Otherwise, the container shall be a 55-gallon drum with top locked in place by proper locking ring. Material inside drums shall be packed so that vehicle accidents which might result in movement of drums would have a minimum tendency to cause shifting of shielding within drums or breakage of glass or similar containers. Furthermore, if glass or other breakable containers are placed within drums, sufficient absorbent material shall be placed around the containers to absorb any leakage.
- (5) The "Radioactive Material" signs must be posted on the truck when transporting radioactive material.
- (6) Proper dose rate and detection-type instruments must be carried in the truck when transporting waste.
- (7) Containers must be monitored before loading. Any significant surface contamination must be cleaned, and no drum is to have a dose rate exceeding 200 mr/hr at surface or 10 mr/hr at one meter, as stated in I.C.C. regulations. (Additional shielding may be used to comply with these limits.) In addition, the truck shall be loaded so that the dose rate to the driver does not exceed tolerance limits.
- (8) Containers are to be securely lashed to the truck during transit.
- (9) The driver is to be familiar with the emergency procedures in Section IX.

c. Preparation for Disposal of Waste Drums

- (1) Interstices in waste material in concrete lined drums are to be poured full of a thin cement slurry. The slurry is to be vibrated (by hand) during filling in order to prevent voids which might cause collapse of the drum when subjected to deep sea pressures. A cinched copper tube is to run from center of drum to surface to help equalize pressures.

- (2) After the inner drum slurry has set up, the space up to the top of the 55-gallon drum is to be poured with normal concrete.
- (3) After a proper curing period (10 days) the drum cap is to be secured with a proper locking ring. Each drum must then be weighed and is not to be disposed of at sea unless it weighs at least 700 pounds.
- (4) Each drum must be identified on top and side by a scribed metal tag welded to the drum or by stamping or engraving the drum itself. The following information is to be included in the identification:
 - Caution - Radioactive Material
 - Isotopes Specialties Company,
 - Burbank, California, U.S.A.
 - Date
 - Most hazardous isotope and quantity of activity contained.
 - Standard radiation symbol.
- (5) Drums are to be painted yellow with red or magenta radiation symbol and the words, "Caution - Radioactive Material", stenciled on top and sides.
- (6) Sealed drums are to be monitored immediately prior to disposal. Any external contamination shall be cleaned. A member of the Isotope Committee shall be notified if the dose rate at the surface of any drum exceeds 200 mr/hr or that at one meter exceeds 10 mr/hr.

d. Disposal of Drums at Sea

- (1) Prior to any disposal event, a site shall be selected and discussed with the U.S. Coast Guard. The site shall be in water at least 2000 fathoms deep and outside of normal shipping lanes. At least ten (10) days prior to disposal, the U.S. Coast Guard, the A.E.C., and the State of California are to be notified of the time and place of disposal.
- (2) All arrangements for handling equipment, transporting vehicles from Isotopes Specialties Company to the pier, and vessels for the sea journey should be completed at least a day before the disposal event in order to insure efficient and fast movement of drums.
- (3) A member of Isotopes Specialties Company, who is familiar with the emergency procedures in Section IX, together with proper instrumentation for measuring dose rates and detecting contamination, shall accompany each transfer of drums to the pier and shall accompany the disposal crew on the sea journey.
- (4) "Radioactive Material" signs must be posted on the transporting vehicle and on the disposal vessel at all times while hauling waste drums.
- (5) Drums must be securely blocked or lashed to the transporting vehicle and to the disposal barge, except that if a hopper-type vessel, such as a garbage scow, is used, drums need not be lashed down.

- (6) Drums are to be loaded in the transporting vehicle so that radiation does not exceed tolerance rate at the driver's location or at nearest approach. (Auxiliary shielding may be used.) Drums are to be loaded in the disposal vessel so that dose rate does not exceed 2 mr/hr in locations occupied during transport to the disposal site.
- (7) Following completion of transporting drums to the pier, the transporting vehicle must be surveyed and any detectable contamination (as measured with portable G.M. and/or Samson meter) must be removed. In the same manner, the disposal vessel shall be surveyed following disposal and any contamination removed.
- (8) Film badges, dosimeters, and gloves are to be worn by all persons handling drums directly. No one other than Isotopes Specialties Company personnel are to so handle the drums directly. Film badges will be supplied other personnel engaged in transporting and disposing of drums and a record of their radiation exposure will be supplied.
- (9) A summary record of the amount and type of radioactivity disposed of at a given site will be made and recorded in the waste disposal log. This record is to be available to all state and federal agencies upon request.

5. Sale

- a. Orders will be accepted from A.E.C. authorized customers. Copy of authorization or statement by customer to effect that he possesses valid authorization #
covering goods ordered, must be in ISC files before shipment except as noted in 5b, 5c, and 5d below.
- b. Contractor operated A.E.C. facilities need not have authorization.
- c. Foreign shipments may be made on our own A.E.C. authorization to non-listed countries with approval by U.S. Department of Commerce and subject to regulations of consignee country. Isotopes 3 to 83 only are authorized for foreign shipments.
- d. Orders may be filled without specific license for quantities of isotopes granted general A.E.C. license as published in Federal Register.
- e. All shipments shall conform with I.C.C. specifications.
- f. Canned tracers shall have radioactive content and radiation level noted on label.

6. Safety Procedures

a. General

- (1) All personnel working in the plant, other than in the office area shall wear film badges. These badges shall be processed weekly and results available to worker and to the Isotope Committee.
- (2) Plant visitors, other than office visitors, shall register and wear film badges.
- (3) All personnel regularly employed in other than the office area shall be instructed by his supervisor to read N.B.S. Handbook 59 and these procedures,, and shall be instructed to ask his supervisor to explain any sections not understood.

- (4) A conference with the Radiological Safety Officer shall be arranged following any exposure above permissible limits as noted on film badges.
- (5) Blood tests shall be taken twice yearly of all employees other than office workers.
- (6) Urinalysis for gross beta-gamma shall be run on all employees other than office workers at routine intervals and at other times deemed necessary by a member of the Isotope Committee.
- (7) Routine surveys, including direct surveys, wipe tests, and air samples, shall be made at the plant and surrounding area at frequencies prescribed by the Isotope Committee. Such surveys shall be carried out under the direction of the Radiation Safety Officer.

b. C-14 Lab. (C-14, S-35, H-3, Kr-85.)

- (1) All persons shall wear lab. coats (or special-issue clothing) and shoe covers (or company-issued shoes) in the C-14 Lab.
- (2) Rubber gloves, respiratory protection, or other protective equipment shall be worn when deemed necessary by the Isotope Committee.
- (3) Hands and shoes shall be monitored when leaving the lab. and decontamination performed if necessary.
- (4) Hands shall be washed when leaving the laboratory whether contaminated or not.
- (5) Urinalysis will be run on all personnel working directly with multicurie quantities of tritium and on all persons working in the vicinity of an area where such operations are being carried out. Such analysis will be made on a weekly basis if the operation is one of a continuing nature or within two days of a single operation.
- (6) Vials or other containers containing multicurie amounts of tritium or tritiated materials shall be handled in the tritium hood and shall not be handled with bare hands.
- (7) A tritium sensitive monitor shall be in operation during all multicurie manipulations of tritium or tritiated materials.
- (8) No more than 100 curies of tritium shall be in process at one time.
- (9) Kr shall be stored in a suitably shielded container in the hood such that the radiation level does not exceed 1 mr/hr at the boundaries of the hood.
- (10) A Kr sensitive air monitor shall be in operation during all curie-level operations involving Kr.
- (11) The C-14 Lab. shall be permanently posted.

c. Hot Lab. Area (other nuclides than above).

- (1) All persons shall wear lab. coats and shoe covers (or company-issued shoes) in the Hot Lab. area.
- (2) Rubber gloves, respiratory protection, or other protective equipment shall be worn when deemed necessary by the Isotope Committee.
- (3) Hands and shoes shall be monitored when leaving the Hot Lab. area and decontamination performed if necessary.
- (4) Hands shall be washed when leaving the Hot Lab. area whether contaminated or not.
- (5) The area shall be monitored after each major Hot Lab. operation involving transfer of open activity. Wipe tests shall be made whenever indicated.

- (6) All work in the encapsulation facilities shall be continuously monitored. Work is to stop and sources are to be returned to storage if dose rates to personnel exceeding 100 mr/hr are encountered, until further work is authorized by the Isotope Committee.
- (7) Prior to removing sources from storage in the encapsulation facilities, it should be ascertained that no persons are in or are planning to enter the attic or roof areas above these facilities.
- (8) The area surrounding the Hot Lab. area (including Research Chemicals Co. facilities) is to be monitored at least weekly and further shielding provided if dose rates exceed 1 mr/hr.
- (9) All persons working in the polonium room are to wear neutron dosimeters and neutron film badges in addition to the usual equipment.
- (10) Urinalysis will be run on all persons working in the polonium room. Such analysis will be performed weekly if the operation is of a continuing nature, or immediately after a single operation.
- (11) Hands and shoes shall be monitored when leaving the polonium room.
- (12) Rubber gloves shall be worn (in addition to lab. coats) during all work in the gloves of the glove boxes in the polonium room. Gloves shall be monitored after each removal from the glove box.
- (13) Polonium packages are to be opened only inside the first glove box.
- (14) Neutron sources are to be removed from the second glove box only after wipe tests have proved negative.
- (15) Respiratory protection is required when changing gloves in the glove boxes in the polonium room and when removing any equipment from the glove boxes. Plastic bagging techniques should be used for such removals.
- (16) Neutron monitoring is to be performed when neutron sources are first heated in the polonium room.
- (17) The Hot Lab. area shall be permanently posted.

d. Waste Storage Pit

- (1) Only sealed drums shall be stored in or handled in storage pit.
- (2) All persons shall wear shoe covers (or company-issued shoes) when working inside the storage pit.
- (3) Rubber gloves, lab. coats, or other protective equipment shall be worn when deemed necessary by the Isotope Committee. No drums shall be opened in the storage pit.
- (4) Hands and shoes shall be monitored when leaving the storage pit and decontamination performed if necessary.
- (5) After each addition of drums to the storage pit, the surrounding area shall be monitored. Rearrangement or additional shielding will be required if a dose rate greater than 1 mr/hr is found outside the fenced area or greater than 6 mr/hr inside the fenced area.
- (6) The storage pit shall be permanently posted.

7. Record System

- a. Records shall be kept of all activity received, together with specifications of this activity noted on packing lists and found by assay.

- b. Records shall be kept of all sources shipped including source number or batch number plus pertinent wipe test data plus assay where required.
- c. Records shall be kept of all waste materials received from customers, all waste stored in the storage pit, and all waste disposed of at sea.
- d. Records shall be kept of all activity shipped in any form or quantity as part of office bookkeeping system.

8. Isotope Committee

- a. Function of this committee shall be to maintain radiation safety standards within the company.
- b. Committee shall consist of not less than three members, one of whom shall be Radiological Safety Officer. Initial committee makeup shall be:
 - Karl Amlauer, Chairman
 - Richard Dickey, Radiological Safety Officer
 - Allen Goldstein
 - Philip Gill
 - Richard Donelson
 - Charles Miller
- c. Committee shall survey facilities and operations at frequent intervals and shall inspect survey records and require changes to be set up where indicated.

9. Emergency Procedures

a. In-plant Emergencies

Emergencies involving radioactive materials might be caused by plant operations (fire, explosion, accidental release of materials, etc.) or by external forces (earthquake, storm, enemy action, etc.) The following general procedures shall apply.

- (1) Any injured persons should be removed from the affected area. Medical treatment should take precedence over decontamination measures, etc.
- (2) Small fires should be extinguished immediately if possible. If impossible to prevent spread of fire, personnel should evacuate the area, the fire department should be notified, and further fire fighting should be done only with proper respiratory protection.
- (3) A member of the Isotope Committee shall be notified immediately of any incident which causes or threatens to cause:
 - (a) Exposure of any individual to 3 rem. or more of radiation (including radioactive material taken into the body).
 - (b) The release of radioactive material outside restricted areas in concentration above permissible limits.
 - (c) Known or suspected loss or theft of radioactive materials.
 - (d) Damage to property in excess of \$1000.00.The Isotope Committee will make the notification to the nearest A.E.C. Operations Office (San Francisco) as required by the schedule published in the Federal Register.
- (4) The affected area should be surveyed as soon as possible to assess the radiological hazard. If necessary, barricades and signs should be posted.
- (5) Civil authorities should be notified if a hazard exists for the general public.

b. Emergencies during Transportation of Radioactive Materials

In the event of accident or emergency, which results in the escape of radioactive materials, while transporting such materials, employees shall take the following action:

- (1) Survey the situation and assess the radiological hazard.
- (2) If necessary, erect barriers, post signs, and establish guards.
- (3) Telephone one member of the Isotope Committee.
- (4) Notify civil authorities if a hazard exists for the general public or if their assistance is needed.
- (5) Remain at the scene as responsible person until relieved.

UNITED STATES ATOMIC ENERGY COMMISSION

DOCKET NO. 27-7

ISOTOPES SPECIALTIES COMPANY

NOTICE OF ISSUANCE OF BYPRODUCT AND SOURCE MATERIAL LICENSE
TO PROVIDE RADIOACTIVE WASTE DISPOSAL SERVICE

Please take notice that no requests for formal hearing having been filed following filing of the notice of proposed action with the Federal Register Division, the Atomic Energy Commission has this date issued the following Byproduct and Source Material License No. 4-580-5 authorizing Isotopes Specialties Company, Inc. to receive, possess, package, and dispose of byproduct and source material in the Pacific Ocean in accordance with the terms and conditions of said license. The notice of proposed action was published in the FEDERAL REGISTER on March 8, 1958. For further details see the application for a license at the Commission's Public Document Room, 1717 H Street, NW, Washington, D.C.

FOR THE ATOMIC ENERGY COMMISSION

H. L. Price
Director
Division of Licensing and Regulation

Dated at Germantown, Maryland
this 21st day of August, 1958.

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BYPRODUCT AND SOURCE MATERIAL LICENSE

ISOTOPES SPECIALTIES COMPANY

DOCKET NO. 27-7

License No. 4-580-6
(H60)

Pursuant to the Atomic Energy Act of 1954, as amended, and Title 10, Code of Federal Regulations, Chapter 1, Part 30, "Licensing of Byproduct Material" and Title 10, Code of Federal Regulations, Chapter 1, Part 40, "Control of Source Material," and in reliance on statements and representations heretofore made by the applicant, a license is hereby issued to Isotopes Specialties Company, Inc., 170 West Providencia, Burbank, California, to receive, possess, package, and dispose of waste byproduct and source material in the Pacific Ocean.

This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to the provisions of 10 CFR Part 20, "Standards for Protection Against Radiation," and all other applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to the following conditions:

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1. The licensee shall not possess more than 100 curies of byproduct material at any one time.
2. The licensee shall not possess during the term of this license a total quantity of more than 2,000 pounds of uranium or thorium or any combination thereof contained in source material.
3. The byproduct and source material shall be received, possessed, packaged and disposed of, by, or under the supervision of Allen M. Goldstein.
4. The licensee shall receive, possess, package, and dispose of the byproduct and source material in accordance with procedures described in his application dated December 2, 1957, and attachments thereto, except as provided otherwise in this license.
5. A copy of the administrative procedures, attached to the application dated December 2, 1957, shall be supplied to each of the licensee's employees who are involved in the receipt, possession, packaging and disposal of the byproduct and source materials.
6. The licensee shall notify the Chief, Isotopes Branch, Division of Licensing and Regulation, Atomic Energy Commission, by letter deposited in the United States mail properly stamped and addressed, at least 20 days prior to each disposal, of the proposed date for disposal, the proposed disposal location in latitude and longitude, the total number of containers, the total activity of the byproduct material in millicuries, and/or total weight of source material, and the most hazardous radioisotope in each container.

7. Byproduct Material License Number 4-580-3 issued on September 27, 1957 is hereby terminated.
8. A curie of Iridium 192 is defined as that quantity of activity which emits a radiation intensity of 0.55 roentgen per hour at a distance of one meter.

This license shall be effective on the date issued and shall expire on August 31, 1960.

FOR THE ATOMIC ENERGY COMMISSION

H. L. Price
Director
Division of Licensing and Regulation

Date of Issuance: AUG 21 1958