



ENVIRONMENT, HEALTH AND SAFETY, 0920
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9500 GILMAN DRIVE
LA JOLLA, CALIFORNIA 92093-0920

December 16, 1999

Christi Hernandez, Radiation Specialist
Nuclear Materials Safety Branch 1, Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

Ref: University of California, San Diego Radioactive Materials License 1339-37
R/V New Horizon, presently RTS#000164
R/V Roger Revelle, presently RTS#000163
R/V Melville, presently RTS#000985

Dear Ms. Hernandez,

Please find here clarifications and further details regarding year 2000 UCSD research vessel cruises. This letter is complementary to the NRC Form 241 and its attachment for the 2000 calendar year.

- 1) New Cruise, *R/V New Horizon*, presently RTS#~~000164~~
Location: Offshore waters along the California coast.
Dates: 1/5/00 - 2/1/00.
Description: This project will support marine biology and fisheries research off the California coast. Carbon-14 is used in plankton productivity studies.
Radioisotope: carbon-14, 5.33 mCi.
- 2) New Cruise, *R/V Roger Revelle*, presently RTS#~~000163~~
Location: East Sea/Sea of Japan.
Dates: 1/14/00 - 2/7/00
Description: Carbon 14 will be used in plankton productivities studies related to marine biology and ocean chemistry research.
Radioisotope: carbon-14, 1 mCi.
- 3) New Cruise, *R/V Melville*, presently RTS#~~000985~~
Location: Offshore waters along Southern California, Mexico, Cost Rica, Panama and Ecuador.
Description: A Cs-137 sealed source will transit to Manzanillo, Mexico. Once the research party joins the ship, the source will be used for sediment core analysis.
Dates: 2/12/00 - 5/14/00 (transit), 5/15/00 - 6/11/00 (use).
Radioisotope: cesium-137, 12 mCi.

All radioactive science samples, contaminated lab equipment, and wastes will be returned to UCSD for further processing, further use, or disposal. If you have questions or comments regarding this letter's contents, please contact me at (619) 534-1069 or Sandy O'Brien at (619) 534-6103. Thank you for your assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ken Helm', written over the word 'Sincerely,'.

Ken Helm, Health Physicist
Radiation Safety Officer
University of California, San Diego

RADIOACTIVE MATERIAL LICENSE

Pursuant to the California Code of Regulations, Division 1, Title 17, Chapter 5, Subchapter 4, Group 2, Licensing of Radioactive Material, and in accordance with the statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, possess, transfer, or dispose of radioactive material listed below; and to use such radioactive material for the purpose(s) and at the places(s) designated below. This license is subject to all applicable rules, regulations, and orders of the Department of Health Services now or hereafter in effect and to any standard or specific condition specified in this license.

1. Licensee	The Regents of the University of California, San Diego	3. License Number	1339-37	Amendment Number: 68
2. Address	9500 Gilman Drive La Jolla, CA 92093-0920	4. Expiration date	December 31, 2001	(1)
Attention:	Marty McDougall Director, Environmental Health and Safety	5. Inspection agency	Radiologic Health Branch Los Angeles	

License Number 1339-37 is hereby amended in its entirety.

6. Nuclide	7. Form	8. Possession Limit
A. Groups 1, 2, 3, 4 and 5 as specified in Item 9. Any radionuclide with atomic number 3-83.	A. Any	A. Combined possession limit for Groups 1, 2, 3, 4 and 5 not to exceed 8.72 Ci.
B. Group 6 as specified in Item 9. 1. Any radionuclide with atomic number 3-83. 2. Cesium-137 3. Iridium-192 4. Palladium-103 5. Iodine-125 6. Iridium-192 7. Strontium-90	B. 1. Sealed or solid sources manufactured in accordance with a specific license issued by the United States Nuclear Regulatory Commission, an Agreement State or a Licensing State. 2. Sealed sources 3. Seeds 4. Seeds 5. Seeds 6. Sealed source (Mallinckrodt Model DRN-07736) 7. Applicator	B. 1. Total not to exceed 35 Ci. No single source to exceed 25 Ci. 2. Total 1.5 Ci, in 70 sources, no single source to exceed 75 Ci. 3. 2 Ci. 4. 500 mCi. 5. 2.5 Ci. 6. Total 36 Ci, in 3 sources, no single source to exceed 12 Ci. 7. Total 70 mCi in 1 source.
C. Group 9 as specified in Item 9. Any radionuclide with atomic numbers 3-83, inclusive, except: Strontium-90 and Lead-210.	C. Sealed or solid sources manufactured in accordance with a specific license issued by the United States Nuclear Regulatory Commission, an Agreement State or a Licensing State.	C. Total not to exceed 50 mCi. Each source not to exceed 20 mCi.

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6. Nuclide	7. Form	8. Possession Limit
D. Hydrogen-3	D. Any	D. Total not to exceed 50 Ci.
E. Any nuclide with atomic number 3-83 inclusive.	E. Any	E. Total not to exceed 100 Ci.
F. Any nuclide with atomic number 3-83 inclusive.	F. Sealed sources manufactured and distributed in accordance with a specific license issued by the United States Nuclear Regulatory Commission, an Agreement State or a Licensing State.	F. Total not to exceed 30 Ci.
G. Any nuclide with atomic numbers 84-105 inclusive, except: special nuclear material and source material.	G. Any	G. Total not to exceed 100 mCi.
H. Any nuclide with atomic numbers 84-105 inclusive, except: special nuclear material and source material.	H. Sealed sources manufactured and distributed in accordance with a specific license issued by the United States Nuclear Regulatory Commission, an Agreement State or a Licensing State.	H. Total not to exceed 1 Ci.
Source material	I. Any	I. Total not to exceed 100 pounds.
J. Special nuclear material	J. Any	J. Total not to exceed 10 grams.
K. Special nuclear material	K. Sealed sources manufactured and distributed in accordance with a specific license issued by the United States Nuclear Regulatory Commission, an Agreement State or a Licensing State.	K. Total not to exceed 180 grams.
L. Cesium-137	L. Sealed source (J. L. Shepherd Model No. 6810)	L. 1 source not to exceed 8,000 Ci.
M. Cesium-137	M. Sealed source (Isomedix ISO-1000)	M. 1 source not to exceed 800 Ci.
N. Plutonium-239:Beryllium	N. Sealed source (Monsanto Research Corp.)	N. 1 source not to exceed 15 grams (0.94 Ci).
O. Radium-226	O. Sealed source	O. 1 source not to exceed 150 μ Ci.
P. Cesium-137	P. Sealed source (IPL)	P. 1 source not exceed 100 mCi.
Q. Cesium-137	Q. Sealed source (Technical Operations Model 77302)	Q. 1 source not to exceed 165 mCi.

RADIOACTIVE MATERIAL LICENSE

License Number: 1339-37Amendment Number: 689. Authorized Use

To be used for nuclear medicine procedures as specified in groups below:

- A. Group 1 Diagnostic studies involving measurement of uptake, dilution, or excretion but not involving imaging.
- Group 2 Diagnostic studies involving imaging including the use of Xenon-127 and/or Xenon-133 gas.
- Group 3 Reagent kits including Mo/Tc-99m and Rb/Kr-81m generators for preparation of radiopharmaceuticals listed in Group 2.
- Group 4 Internal therapy and palliative treatment not usually requiring hospitalization.
- Group 5 Internal therapy and palliative treatment requiring hospitalization for purposes of radiation safety.
- B. Group 6 Brachytherapy and Ophthalmic treatments utilizing sealed or solid sources manufactured, labeled, packaged, and distributed in accordance with a specific license issued pursuant to Title 10, Code of Federal Regulations, Part 32.74, or a specific license issued by an Agreement State or a Licensing State pursuant to equivalent state regulations (except for sources manufactured prior to August 16, 1974).
- 1.-5. Brachytherapy
6. To be used in a Nucletron MicroSelectron HDR. Activity of source used during treatment not to exceed 10 Ci.
7. Applicator
- C. Group 9 Marker and calibration sources.
- D. & E. To be used for research and development as defined in Title 17, California Code of Regulations, Section 30100, instructional purposes and research studies in humans, as defined in Part 21, Code of Federal Regulations, Section 361.1 and as approved by a Food and Drug Administration Radioactive Drug Research Committee under the provisions of Part 21, Code of Federal Regulations, Section 361.
- F.-K. To be used for research and development as defined in Title 17, California Code of Regulations, Section 30100 and instructional programs.
- L. To be used as a component of a J. L. Shepherd Model Mark I submodel 30-2 irradiator.
- M. To be used in an AECL Model Gammacell 1000A Blood Irradiator.
- N.-P. To be used for calibration of licensee's survey meters (in-house only).
- Q. To be used as a component of a Technical Operation Model 773 instrument calibrator for calibration of the licensee's survey meters (in-house only).

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License Number: 1339-37Amendment Number: 68LICENSE CONDITIONS

10. Radioactive material shall be used only at the following locations:
- (a) University of California, San Diego Campus, La Jolla, CA
(Subitems D.-L. and N.-Q.)
 - (b) UCSD Medical Center, 200 West Arbor Drive, San Diego, CA
(Subitems A.-E. and M.)
 - (c) Other facilities owned or leased by the University of California, San Diego, as follows:
 - (1) U.C.S.D. Receiving Department, 7835 Trade Street, Suite 100, San Diego, CA
 - (2) Nimitz Marine Facility, San Diego, CA and on vessels owned or leased by the University of California, San Diego (California waters only).
 - (3) Mount Soledad Counting Facility, La Jolla, CA
 - (4) Elliot Field Station, Pomerado Road, San Diego, CA
 - (5) 15090 Avenue of Science, Suite 103, Rancho Bernardo, CA
 - (6) Thornton Hospital, 9300 Campus Pointe Drive, La Jolla, CA
 - (7) Perlman Ambulatory Care Center, 9350 Campus Pointe Drive, La Jolla, CA
 - (8) Shiley Eye Clinic, 9415 Campus Pointe Drive, La Jolla, CA
 - (9) Trinidad Head, CA
11. This license is subject to an annual fee for sources of radioactive material authorized to be possessed at any one time as specified in Items 6, 7, 8 and 9 of this license. The annual fee for this license is required by and computed in accordance with Title 17, California Code of Regulations, Sections 30230-30232 and is also subject to an annual cost-of-living adjustment pursuant to Section 100425 of the California Health and Safety Code.
12. All uses of radioactive material under this license shall be conducted in accordance with the user's application to and modifying requirements of the Radiation Safety and Surveillance Committee. The review of intramural applications shall include findings with respect to matters specified in Title 17, California Code of Regulations, Section 30194, and if human use is at issue, Section 30195. Documentation of these findings shall be maintained for Department inspection.

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13. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6, 7, 8 and 9 of this license in accordance with the statements, representations, and procedures contained in the documents listed below. The Department's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- (a) The application, with attachments, dated November 29, 1990, signed by Steven W. Relyea, as modified by the letters, with attachments, dated April 30, 1993, January 24, 1994, May 17, 1994, June 24, 1994, July 22, 1994, September 20, 1994, February 7, 1995, June 9, 1995, and October 20, 1995 all signed by Ken Helm.
 - (b) The letter, with attachments, dated April 22, 1993, signed by Kenneth Helm, relative to the new hot lab location.
 - (c) The letter, with attachments, dated December 21, 1994, signed by Kenneth Helm, relative to the new use location at 9894 Genesee Avenue, La Jolla, CA.
 - (d) The letter, with attachments, dated January 26, 1995, signed by Kenneth Helm, relative to administrative procedures for the Gamma Med II-i HDR.
 - (e) The letters, with attachments, dated September 21, 1995, October 19, 1995 and November 6, 1995 all signed by Ken Helm, Radiation Safety Officer, regarding the licensing and start up of the new waste handling facility.
 - (f) The letters dated November 7, 1997 and December 24, 1997, as modified by the letter, with attachment, dated December 29, 1997, all signed by Ken Helm, Radiation Safety Officer, relative to administrative procedures for the Nucletron MicroSelectron HDR.
 - (g) The letter, with attached application for the licensee's medical facilities, dated July 21, 1998, signed by Kenneth Helm, Radiation Safety Officer, as supplemented by the letter, with attachments, dated November 24, 1998, signed by Kenneth Helm, Radiation Safety Officer and Martha McDougall, Director, Environmental Health and Safety.
 - (h) The letter, with attachment, dated August 4, 1998, signed by Ken Helm, Radiation Safety Officer, regarding the new use location for a generally licensed gas chromatograph and the removal of the Gamma Med II HDR.
14. (a) The Radiation Safety Officer in this program shall be Ken Helm.
- (b) (1) The Chairperson of the Radiation Safety and Surveillance Committee shall be Scott D. Emr, Ph.D.
 - (2) The Chairperson of the Human Exposure Review Committee shall be David W. Yeung, M.D.
 - (c) (1) The Custodian of sealed sources shall be Roger Rice and Richard Le Page.
(Radiation Oncology at UCSD Medical Center, Hillcrest)
 - (2) The Custodian of sealed sources shall be Sara Neff.
(Nuclear Medicine at UCSD Medical Center, Hillcrest)
 - (3) The Custodian of sealed sources shall be Adrienne Jones-Lafaso.
(Thornton Hospital)
 - (d) The Alternate Radiation Safety Officer in this program shall be Martha McDougall.

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15. Sealed sources possessed under this license shall be tested for leakage and/or contamination as required by Title 17, California Code of Regulations, Section 30275 (c).
16. Except for alpha sources, the periodic leak test required by Condition 15 does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
17. The following individuals are authorized to collect wipe test samples of sealed sources possessed under this license using leak test kits acceptable to the California Department of Health Services:
 - (a) The Radiation Safety Officer
 - (b) Qualified individuals designated in writing by the Radiation Safety Officer
18. The licensee is authorized to calibrate radiation detection instruments for his own use. Each calibration of a radiation detection instrument shall include not less than 2 points other than zero (separated by 50 percent of full scale) for each scale of the instrument certified by the licensee.
19. The licensee is authorized to hold radioactive materials with a physical half-life of less than 115 days for decay in storage before disposal in ordinary trash provided:
 - (a) Radioactive waste to be disposed of in this manner shall be held for decay in storage for at least 10 half-lives.
 - (b) Before disposal as normal waste, radioactive waste shall be surveyed to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
 - (c) Generator columns shall be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.
20. For a period not to exceed 60 days in any calendar year, a visiting physician is authorized to use licensed materials for human use under the terms of this license, provided the visiting physician:
 - (a) Has the prior written permission of the hospital's Administrator and its Radiation Safety Committee.
 - (b) Is specifically named as a user on a U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State license authorizing human use.
 - (c) Performs only those procedures for which the physician is specifically authorized by the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State license.

The licensee shall maintain for inspection copies of the written permission specified in (a) above and the licensee(s) specified in (b) and (c) above. These records shall be maintained for five years from the time the licensee grants its permission under (a) above.

21. The licensee may use any commercially available device, acceptable to the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State, for doing linearity tests of its dose calibrator provided the procedures described by the manufacturer of the linearity device are followed.

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22. Nuclear medicine technology procedures shall be performed by nuclear medicine technologists pursuant to Title 17, California Code of Regulations, Subchapter 4.6. Such procedures shall be performed under the supervision of individuals listed as authorized users on this license who meet the criteria specified in Section 30510. Certificates or special permits issued pursuant to Subchapter 4.6 shall be prominently displayed at the facility(ies) authorized on this license.
23. Treatment and management of patients receiving therapeutic quantities of unsealed radioactive materials shall be in accordance with guidance contained in Chapter 4, "Release from Hospital of Patients Containing Radioactive Material" National Council on Radiation Protection and Measurements (NCRP) Report No. 37, "Precautions in the Management of Patients Who Have Received Therapeutic Amounts of Radionuclides" (NCRP Publications, P.O. Box 30175, Washington, D.C. 20014).
24. If there is reason to suspect that a medical radium source may be leaking or contaminated, it shall be tested before further use, by a method acceptable to the Department of Health Services, and a report of the test results and the action taken shall be submitted within 30 days to the Radiologic Health Branch.
25. Treatment and management of patients undergoing brachytherapy shall be in accordance with guidance contained in Chapter 5, "Safety Precautions in Clinical Application", National Council on Radiation Protection and Measurements (NCRP) Report No. 40, "Protection Against Radiation From Brachytherapy Sources" (NCRP Publications, P.O. Box 30175, Washington, D.C. 20014).
26. Remote afterloading device facilities shall be so constructed as to permit continuous observation of patients from outside the treatment room(s).
27. Written emergency instructions shall be posted conspicuously at the remote afterloading device control(s). Instructions shall include directions for manually turning off the remote afterloading device(s), removing the patient, securing the room(s) against unauthorized entry, and notifying the responsible authorized user or the Radiation Safety Officer.
28. Electrical interlock(s) on entrance door(s) to the remote afterloading device room(s) shall be tested for proper operation at least once every month. Records of test results shall be maintained available for inspection.
29. If there is a reason to suspect that the source position indicator or entrance door(s) interlock(s) is/are not functioning properly, use of the remote afterloading device(s) shall be discontinued until the condition has been corrected. A record of any such malfunction shall be made and maintained available for inspection.
30. Special Requirements for Remote Afterloading Device Spot-Checks and Calibration:
 - (a) At intervals not to exceed daily or prior to use (if used less frequently), the following tests shall be performed:
 - (1) Source position indicator(s).
 - (2) Source positioning reproducibility, to within ± 1 mm.
 - (3) Inspection of guide tubes for kinks and other imperfections.

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- (b) At intervals not to exceed monthly or prior to use (if used less frequently), the following tests shall be performed:
- (1) Accuracy of the timing device.
 - (2) Source travel time error.
- (c) At each source loading and intervals not to exceed three months, (one month for Ir-192) thereafter, the licensee shall determine the dose accuracy to within ± 5 percent.
31. Remote afterloading devices authorized by this license shall not be operated unless the licensee has in his possession detailed written instructions specific for the make and model of the remote afterloading device.
 32. Each remote afterloading device shall be inspected and serviced in accordance with the manufacturer's recommendations.
 33. For remote afterloading devices, specifically authorized personnel shall:
 - (a) Install, relocate, maintain and repair devices containing radioactive material.
 - (b) Leak test, replace and dispose of sealed sources containing radioactive material used in devices.
 34. Subsequent to each source loading, radiation surveys shall be performed prior to human use as follows:
 - (a) A radiation survey shall be made of the unit source housing, with the source(s) in the shielded position. The maximum radiation levels at 20 centimeters from the surface of the source housing shall not exceed 3 milliroentgens per hour.
 - (b) Records of survey results shall be maintained for inspection.
 35. Immediately after retracting the source from the patient into its shielded position in the remote afterloading device, a radiation survey shall be made of the patient with a portable radiation detection survey instrument to confirm that the source has been removed from the patient. Records of each survey shall be maintained.
 36. Treatment time calculations and data entry for remote afterloaders shall be individually verified by the responsible physician named on the license immediately prior to treatment.
 37. The licensee shall conduct a physical inventory every six months to account for all sealed sources and/or devices received and possessed under the license. Records of the inventories shall be maintained for inspection, and may be disposed of following Department inspection.
 38. The licensee shall comply with all requirements of Title 17, California Code of Regulations, Section 30373 when transporting or delivering radioactive materials to a carrier for shipment. These requirements include; packaging, marking, labeling, loading, storage, placarding, monitoring, and accident reporting. Shipping papers shall be maintained for inspection pursuant to the U.S. Department of Transportation requirements (Title 49, Code of Federal Regulations, Part 172, Sections 172.200 through 172.204).
 39. Radioactive materials shall be used by occupational workers in such a manner that the dose limits specified in Title 10, Code of Federal Regulations, Part 20, Subpart C, Sections 20.1201 through 20.1208 are not exceeded.

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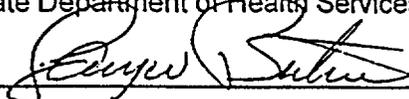
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- 40. The licensee shall monitor occupational exposures to radiation and shall supply and require the use of individual monitoring devices by personnel as required by Title 10, Code of Federal Regulations, Part 20, Section 20.1502 (a).
- 41. The licensee shall monitor occupational intakes of radioactive material by, and assess the committed effective dose equivalent to, individuals who may have exceeded or are likely to exceed, the limits specified in Title 10, Code of Federal Regulations, Part 20, Section 20.1502 (b). Suitable and timely measurements used for determination of such internal exposures shall be performed as specified by Section 20.1204.
- 42. A copy of this license and a copy of all records and documents pertaining to this license shall be maintained available for inspection at 9500 Gilman Drive, La Jolla, CA.

For the State Department of Health Services

Date: February 18, 1999

By: _____



Radiologic Health Branch
P.O. Box 942732-MS 178, Sacramento, CA 94234-7320