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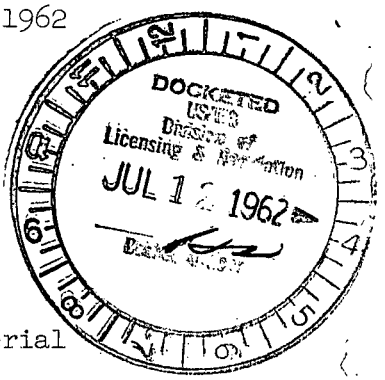
UNION CARBIDE NUCLEAR COMPANY
DIVISION OF UNION CARBIDE CORPORATION
P. O. BOX 324, TUXEDO, NEW YORK

RESEARCH CENTER

July 11, 1962



Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Att: Mr. Robert Lowenstein, Director

Gentlemen:

Re: Application for Broad Specific Byproduct Material License and for Source and Special Nuclear Material Licenses.

We hereby submit ten copies of an application for a broad Specific Byproduct Material License to conduct research and development activities in our Radioactive Materials Laboratory. At the recommendation of Dr. Clifford Beck and members of your staff, the application also includes a request for Special Nuclear Material and Source Material Licenses. The combined application seems desirable since the Radioactive Materials Laboratory is operated in conjunction with our 5 MW research reactor and many of the byproduct materials, source materials and special nuclear materials to be worked with in the Radioactive Materials Laboratory are to be produced in the reactor. The production of radioisotopes and irradiation of source or special nuclear material in the reactor has already been approved by the Research and Power Reactor Safety Branch in amendment No. 2 dated February 8, 1962 to our Facility Operating License No. R-81 issued on September 7, 1961.

At the present time the Radioactive Materials Laboratory is working with irradiated materials produced in the Reactor. This is done under seven specific licenses as referenced in the attached application. Full utilization of our nuclear facilities cannot be realized until the Radioactive Materials Laboratory is licensed to possess and use the radioactive material that can be produced in the adjacent reactor or that can be purchased from other distributors. Both the production and use of this material is, of course, limited by the safety considerations described in the appropriate Hazards Analyses.

We realize that the application is more complex than most and will require the approval of several of your Branches. If there are questions that can be answered by telephone, please do not hesitate to call us collect. If you or your staff feel that a meeting, either here or in Germantown, will be helpful in processing this application we are prepared to meet at your convenience.

Very truly yours,

UNION CARBIDE CORPORATION
Acting by and through its Division
UNION CARBIDE NUCLEAR COMPANY

By: D. B. Holzgraf

D. B. Holzgraf
Superintendent of Operations,
Union Carbide Nuclear Company
Research Center

R-7368

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Form AEC-313 (5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

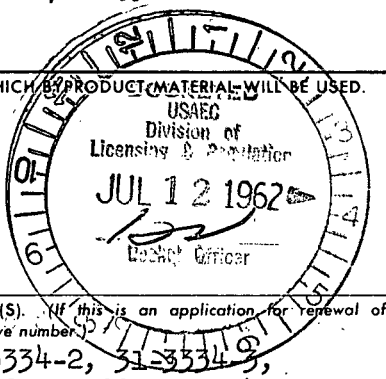
Form approved. Budget Bureau No. 38-R027.4.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital, person, etc.)*

Union Carbide Nuclear Company
Division of Union Carbide Corporation
P.O. Box 324
Tuxedo, New York

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. *(If different from 1 (a).)*



2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Research Center

3. PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

31-3334-1, 31-3334-2, 31-3334-3,
SNM-221, SNM-498, C-3885, SMB-470

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

Individuals designated by the Research Center's Nuclear Safeguards Committee

5. RADIATION PROTECTION OFFICER *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

C. J. Konnerth

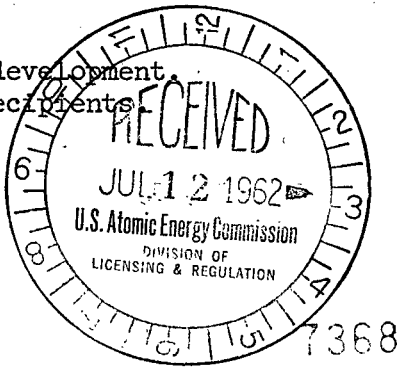
6. (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*

See supplemental sheet

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

Materials will be used in a broad program of research and development. Some materials will be packaged for transfer to licensed recipients.



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(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 *(Use supplemental sheets if necessary)*

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	See Appendix A of attached Hazards Report		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9. EXPERIENCE WITH RADIATION. *(Actual use of radioisotopes or equivalent experience.)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
See Appendix A of attached Hazards Report				

10. RADIATION DETECTION INSTRUMENTS. *(Use supplemental sheets if necessary.)*

TYPE OF INSTRUMENTS *(Include make and model number of each)*	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE *(mr/hr)*	WINDOW THICKNESS *(mg/cm²)*	USE *(Monitoring, surveying, measuring)*
See Section E of attached Hazards Report					

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

See Section E of attached Hazards Report

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. *(For film badges, specify method of calibrating and processing, or name of supplier.)*

See Section E of attached Hazards Report

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. *(Circle answer)* Yes No

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, 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.

Union Carbide Nuclear Company
Division of Union Carbide Corporation
Applicant named in item 1

Date July 10, 1962

By: D. B. Holzgraf
D. B. Holzgraf
Superintendent of Operations
Title of certifying official

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.

* U.S. GOVERNMENT PRINTING OFFICE : 1961 O—590221

Form AEC-313

6(a) Byproduct Material	(b) Physical form and maximum number of curies of each
A) All radioisotopes between 3 and 83, inclusive	100 curies of each in any form. 1000 curies of each as unsealed solids with a total possession limit of 50,000 curies.
B) Neutron irradiated metals and alloys	Total possession limit of 25,000 curies.
C) Irradiated components	Total possession limit of 25,000 curies.
D) Spent fuel elements	4 spent fuel elements from Union Carbide Research Reactor
E) Cobalt 60	Sealed sources with total activity not to exceed 50,000 curies. Unsealed solid sources with total activity not to exceed 10,000 curies.
F) Cesium 137	Sealed sources with total activity not to exceed 50,000 curies.
G) Promethium 147, Cerium 144, Strontium 90, Niobium-Zirconium 95	Sealed sources with total activity not to exceed 25,000 curies of each nuclide.
H) Gold 198	Unsealed solid with total activity not to exceed 5,000 curies.
I) Uranium 235	250 grams in any form.
J) Uranium 233, Plutonium 239	10 grams of each in any form. ✓
K) Thorium 232, Uranium 238	100 pounds of each in any form.
L) Plutonium-Beryllium	Sealed neutron sources with total curie content not to exceed 10 curies.