Form AEC-313 (Rev. March 1951) B. B. No. 38-R027.1.	APPLICATION FOR RADIOISOTOPE PROCUREMENT FOLLOW ATTACHED INSTRUCTIONS	37735 LEAVE BLANK

TO: U. S. ATOMIC ENERGY COMMISSION, POST OFFICE BOX E, OAK RIDGE, TENNESSEE; ATTENTION: ISOTOPES DIVISION

1. NAME AND ADDRESS OF APPLICANT (*Institution, Firm, etc. Follow Instruction No. 3A*)
Nuclear Development Corporation of America
5 New Street, White Plains, New York

2. DEPARTMENT TO USE ISOTOPE (*Follow Instruction No. 2B*)
Materials & Testing Group

3. NAME AND ADDRESS OF INDIVIDUAL USER (*Follow Instruction No. 3A*)
C.K. Leeper, R.C. Ross } 5 New Street, White Plains, New York

4. EXPERIENCE OF THE USER (*Follow Instruction No. 3B*)
(See attached)

RADIOISOTOPE REQUESTED (*Follow Instruction No. 4*)

5. ISOTOPE (*Element and mass number*)	6. CHEMICAL FORM	7. QUANTITY (*Millicuries or irradiated units*)	8. OTHER SPECIFICATIONS
U-238, U-235 Mixed fission products	Alloy of U-238 + U-235 + gaseous + solid m f p	<100C equivalent of irradiated units	

9. ITEM NO. (*If any*) IN U. S. AEC CATALOG	10. NAME AND ADDRESS OF SUPPLIER, IF KNOWN
	MTR, at Arco, Idaho to ANL to NDA

STATEMENT OF USE (*Follow Instruction No. 5*)

11. STATE PROPOSED USE OF RADIOMATERIAL AND GENERAL PLAN OF INVESTIGATION
(See attached)

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 6
FOIA-2001-0039

12. WILL THE RADIOISOTOPE BE USED IN HUMAN BEINGS? (*Follow Instruction No. 6A*)	CIRCLE YOUR ANSWER	YES	(NO)

13. A. HUMAN DOSAGE (*In millicuries per patient*)	B. NUMBER OF DOSES (*Per patient*)	C. NUMBER AND TYPE OF PATIENTS	D. COMPOUND ADMINISTERED	E. SAMPLE TO BE TAKEN FOR MEASUREMENT

14. APPROVAL OF THE USER'S LOCAL ISOTOPE COMMITTEE (*Follow Instruction No. 6B*)
"THE LOCAL ISOTOPE COMMITTEE APPROVES THE HUMAN USE AS INDICATED IN ITEMS 11-13."

(Signature of Chairman, Local Isotope Committee)

15. WILL THE RADIOISOTOPE BE USED IN LOWER ANIMALS?	CIRCLE YOUR ANSWER	YES	(NO)
16. IS A COMPLETED FORM AEC-313A A PART OF THIS APPLICATION? (*Follow Instruction No. 7*)	CIRCLE YOUR ANSWER	(YES)	NO
17. MAY THE ISOTOPES DIVISION RELEASE GENERAL INFORMATION REGARDING MATERIAL USED AND PURPOSE? (*If your answer is "No," please state your reason here*) ITEM # 1	CIRCLE YOUR ANSWER	(YES)	NO

READ THE TERMS AND CONDITIONS ON THE BACK OF THIS SHEET AND SIGN THE CERTIFICATE THAT FOLLOWS—AN UNSIGNED APPLICATION CANNOT BE CONSIDERED

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TERMS AND CONDITIONS

In consideration of the issuance of an authorization from the Commission to enable the applicant to procure or obtain the radioisotopes or irradiation service requested hereon, the applicant agrees that:

1. Radioisotopes purchased or acquired from the Commission or a distributor are shipped f. o. b. the laboratory, plant, facility, or Commission office handling the transaction, at prices and service fees as fixed by the Commission, and title to said materials, if same are not already owned by the applicant, shall pass to the applicant when the materials are delivered to the carrier. When shipment of the materials requires the use of returnable Government-owned containers, title to such containers shall remain in the Government and a deposit to insure return of the containers will be made if required. The applicant will keep the containers in good condition, will not use them for any materials other than the materials shipped therein, and will return them to point of shipment, transportation prepaid, within 21 days of date of shipment.

2. Neither the Government, the Commission, nor any distributor will be responsible for:

   (*a*) any damage to, destruction to, loss of, or changes in physical or chemical properties of materials of any kind accepted for a service irradiation, either as a result of, or in the process of, the irradiation or while said materials are in the possession of the Commission or a distributor;

   (*b*) any injury to persons or other living things or for damage to property caused by handling, shipment, use (including use based on any statement of quality or quantity), storage, transfer, disposal, or reshipment of, or other act or failure to act in connection with any materials purchased or acquired from the Commission or a distributor, or procured from any source upon the Commission's approval, it being expressly agreed that, as between the Commission, the supplying distributor, and the applicant, the applicant assumes complete responsibility and liability for any such injury or damage occurring: Provided, however, That if such injury or damage is caused solely by the negligent packing of the Commission or a distributor this assumption of liability shall not apply.

3. Neither the Government, the Commission, nor any distributor makes any warranty or other representation that (*a*) materials accepted for a service irradiation will not be destroyed, damaged, or otherwise altered in physical or chemical properties in the process of irradiation, and (*b*) radioisotopes (1) will not result in injury or damage when used for the purposes approved by the Commission, (2) will accomplish the results for which they are requested and approved by the Commission, (3) are safe for any other use, or (4) are of a particular quality or quantity. When procuring radioisotopes from the Commission or a distributor the applicant agrees to report promptly whether the amount received represents the amount paid for, in order that discrepancies may be adjusted.

4. Neither the Government, the Commission, nor any distributor shall be responsible, irrespective of cause, for the failure of the Commission, and distributor, or other transferor to (*a*) deliver radioisotopes at specified times, or (*b*) deliver radioisotopes of specified quality.

5. When materials supplied for a service irradiation are:

   (*a*) from an applicant not authorized to possess or use radioisotopes, the Commission or the distributor shall have the right to retain possession and control of the irradiated materials throughout the period of measurable activity of such materials, and unless otherwise stated in the request for service irradiation, may dispose of such materials in accordance with the usual Commission or distributor disposal procedures for radioactive materials;

   (*b*) to be tested or analyzed and retained by the Commission or a distributor, such materials may, unless otherwise stated in the request for service irradiation, be disposed of in accordance with the usual Commission or distributor disposal procedures for radioactive materials.

   It is expressly agreed that if any irradiated materials covered by (*a*) or (*b*) above must be retained by the Commission or a distributor in order to protect health and minimize other hazards to life or property, the applicant will pay all storage and maintenance charges connected therewith, and if any irradiated materials belonging to the applicant are disposed of under the provisions of this paragraph, the applicant shall have no claim for the value or replacement of said materials.

6. The Commission shall have the right to publish and use any information or knowledge acquired as a result of the irradiation of materials furnished by the applicant, including results of tests and analyses made for the applicant in connection with any such irradiated materials.

7. The right to revoke or cancel, with or without cause, arrangements for or agreements for the purchase or acquisition of any radioisotopes from a distributor, including arrangements or agreements for service irradiations, is reserved to the Commission. In the event the Commission revokes or cancels any arrangement or agreement for a service irradiation, the Government, the Commission, and the distributor shall be discharged of all obligations thereunder by return to the applicant of an amount of nonirradiated material of like kind, quality, and quantity as the material accepted for irradiation.

8. Title to and possession of all radioisotopes purchased or acquired from the Commission or from a distributor, or from any source on the authorization or approval of the Commission, remain subject to the Commission's statutory *right to recall*. Title to any materials recalled by the Commission shall vest in the Commission with the exercise of this right, and the Commission may enter and take possession of said materials any time after notice is given that the materials are being recalled: Provided, That if requested, the applicant, at his expense, will make shipment of the recalled materials to a destination designated by the Commission.

9. The applicant agrees to indemnify the Government, the Commission, their officers, agents, contractors, distributors, servants, and employees against liability, including costs and expenses incurred, for infringement of any Letters Patent occurring in the course of any service irradiation, test, or analysis performed for the applicant by the Commission or its distributors, or occurring in the utilization by the applicant of any radioisotopes or irradiated materials.

10. The applicant will furnish to the Isotopes Division six copies of each article published on the results of his investigations using radioisotopes or irradiation services, or will upon request furnish to the Isotopes Division a report of the results of his investigations.

11. Any radioisotopes received as a consequence of this application will be dealt with in accordance with all instructions, recommendations, or standards issued by the Commission for the safe use, handling, or disposal of radioactive materials.

12. All purchase orders and agreements for procuring radioisotopes are subject to the terms and conditions hereof and any contrary conditions of sale or transfer contained in such purchase orders or agreements will not apply.

CERTIFICATE

The applicant and any official executing this application in behalf of the applicant certify that the information stated herein is true and correct, that this application is made under and in conformity with Code of Federal Regulations, Title 10, Atomic Energy, Part 30, Radioisotope Distribution, and agree that this application and any materials procured pursuant thereto are subject to the terms and conditions on this page.

11/25/53
(Date)

Stanley A. Weyandt
(Signature of Applicant or Certifying Official)

Ass't Bus. Mgr.
(Title)

WARNING

18 U. S. C., Sec. 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.

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APPLICATION FOR RADIOISOTOPE PROCUREMENT

PART TWO
PAGE 1 OF 2 PAGES

STATEMENT OF FACILITIES FOR RADIATION MEASUREMENT AND HEALTH SAFETY MONITORING

Radioisotopes may be distributed only to applicants equipped to observe safety standards for the protection of health. This part of form AEC-313 must be completed in triplicate and **left attached to your first application.** *It may be* **detached** *from subsequent applications* **provided,** *there is no change in availability of the items listed.*

18. NAME AND ADDRESS OF APPLICANT (*Institution, Firm, etc.*)	19. DATE
Nuclear Development Corporation of America	11/3/55

20. NAME AND TITLE OF USER (*Same as item 5 above*)		21. DEPARTMENT
C.K.Leeper R.C.Ross	5 New Street, White Plains NY	Materials & Testing Group

LIST OF RADIATION INSTRUMENTS AVAILABLE

22. KIND OF INSTRUMENT	23. MAKE AND SERIAL NO.	24. SENSITIVITY RANGE (*Include window thickness in mg/cm²*)	25. USE (*Health monitoring or measurement*)
Counting Rate Monitor	Model 410	0-200000 cpm 2	Health Monitoring
Juno	AEC Mod. SIC-17c NYAEC 2894	0-5000 mr/hr	Health Monitoring
Nuclear	Model 2610A Ser. No. 627	0-20 mr/hr	Health Monitoring

We have the use of a hi-vol Air Sampler if we need it. We also have a Counting Laboratory for doing Smear Tests, and making discontaminating studies

26. HOW ARE INSTRUMENTS CALIBRATED?

See Below

27. HOW FREQUENTLY ARE INSTRUMENTS CALIBRATED?

Every three months by Radiation Branch, Health & Safety Lab. NYO-AEC

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HEALTH PROTECTION AND MONITORING

28. DESCRIBE PROCEDURES PROPOSED FOR MONITORING AND HEALTH PROTECTION (*Particularly those special features pertinent to your work*)

See Attached

29. NAME AND TITLE OF PERSON TO WHOM RESPONSIBILITY FOR HEALTH PROTECTION WILL BE DELEGATED

H. I. Sax - Safety Officer

30. EXPERIENCE OF ABOVE PERSON (*Item 29*)

See Attached

MISCELLANEOUS EQUIPMENT FOR HEALTH PROTECTION

31. LIST AND DESCRIBE BRIEFLY (*Radiation, shielding, respirators, ventilated hoods, remote handling equipment, etc.*)

See Attached

U. S. GOVERNMENT PRINTING OFFICE 16—57264-4

NDA NUCLEAR DEVELOPMENT CORPORATION OF AMERICA
5 NEW STREET, WHITE PLAINS, N.Y. • TEL. WH 8-5800

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October 6, 1955

United States Atomic Energy Commission
Washington 25, D.C.

Attention: Mr. Lyall Johnson, Chief,
Division of Licensing

Gentlemen:

This letter is an application to receive, possess, use and transfer special nuclear material.

Pursuant to the instructions listed in 10 CFR, Part 70, section §70.22 entitled "Contents of Application", we herewith submit the following information:

(1)i Nuclear Development Corporation of America, 5 New Street, White Plains, New York, State of Incorporation, New York.

J. R. Menke - President [redacted] U.S. Citizen

Gale Young - Vice President
Technical Director [redacted] U.S. Citizen

Gerald Goertzel - Secretary [redacted] U.S. Citizen

Alan R. Gruber - Treasurer [redacted] U.S. Citizen

Arnold M. Zais - Gen.Business Mgr. [redacted] U.S. Citizen

Nuclear Development Corporation of America is an Independent Private Corporation. There is no control or ownership by any alien, foreign corporation, or foreign Government.

(1)ii No stockholder at present owns a controlling interest in the Corporation.

(2) The receipt of special nuclear material is required to carry out research upon the effects of reactor produced radiation upon simulated nuclear reactor fuel elements. It will be our responsibility to receive this special nuclear material, inspect it, load gram quantities into metallic capsules and prepare them for insertion into our MTR facility for irradiation. When irradiation is complete, the now radioactive capsules will be sent to ANL for processing and inspection. The preparation of capsules and storage of the special nuclear material will be accomplished at 5 New Street, White Plains, N. Y. in a 400 ft.^{2} area set aside for this work.

(3) It is requested that a license be granted for a period of ten (10) years.

(5) The special nuclear material involved here is natural uranium enriched with Uranium-235 to a maximum value of 30% by weight. It is to be received in the form of metallic pins 1/8" in diameter and 3/4" long. It is desired to store up to a maximum of 5000 grams of this material.

(6) Does not apply.

(7) The organization of NDA is composed of approximately 105 scientific personnel. The safety schedule is the responsibility of a Safety Officer whose qualifications are as follows:

a) B.S. degree in Chemistry
b) Fifteen (15) years of industrial experience including seven (7) years of industrial toxicology.
c) Presently attending Post-graduate Medical School at New York University and has already completed courses in radiological safety and air pollution, air sampling and air cleaning.
d) Three (3) years of experience with the Health and Safety Laboratory of the New York Operations Office of the Atomic Energy Commission.
e) Member of the Advisory Committee to the New York State Board of Standards and Appeals to write a rule for protection against radiation.
f) Author of "Handbook of Dangerous Materials" a book in the field of industrial safety.

In addition, among the scientists and technicians, employed by NDA are men experienced in nearly every phase of nuclear technology whose skills may be called upon to implement our safety program. The excellent safety record of NDA can attest to our real interest in safety.

NDA_

(8) The special nuclear material will be stored and used so as to maintain the levels of radiation in the working area to a fraction of the tolerance level of gamma radiation, zero beta and zero alpha radiation. Such small amounts will be handled at any one time, that our safety procedures are quite simple. We will do an occasional air sampling for area monitoring and periodic smear testing and alpha counting of the work surfaces. We will alpha count smears and air samples by means of alpha-sensitive proportional counters. We will normally do space sampling by means of a Juno-meter. Also, we do presently have a license for natural Uranium, an Isotopes Division Authorization to receive up to 15 curies of mixed fission products as well as an Isotopes Division Authorization to receive up to 0.6 curies of Co-60.

(9) We do at this time limit ourselves to 5000 grams of 30% or less enriched U +U-235. It is our understanding that there is no criticality danger from this quantity and enrichment of material. Our only other inventory of S/F material is a maximum of 15 grams of U-235. In addition, please be advised that we are an accountability station. Therefore, if all of our S/F material were to be in one place at the same time it would amount to 1515 grams of U-235, practically all of which would be as a 30% alloy with U-238. Actually, we expect to receive our S/F material in shipments of gram quantities at a time. Much of what we receive will be used and out of the plant by the time the next gram quantity shipment arrives, etc.

We trust the above information is sufficient for the purpose of obtaining a license for the activity outlined.

However, should more details be needed we will, of course, be happy to supply them.

Sincerely yours,

NUCLEAR DEVELOPMENT CORPORATION of AMERICA

Stanley H. Shippenberg
Assistant Business Manager

SHS:rkc

State of New York)
County of Westchester) ss:

On the 5th day of November 1955 before me personally came Stanley H. Shippenberg to me known and known to me to be the individual, who executed the foregoing instrument, and adknowledged to me that he had executed the same.

GERTRUD STUBING
Notary Public, State of New York
No. 60-9229550
Appointed in Westchester County
Commission Expires March 30, 1956

Notary Public.

4. Experience of the User

The users of the data from this irradiation service are Mr. C. K. Leeper, Head of Materials and Testing Group and Mr. R. C. Ross, Project Leader of AEC Project under which work is to be done.

Although these men will receive the data acquired as a result of the irradiation of the samples, neither man will have any direct contact with the materials themselves.

All of the manipulation of the samples, remote and otherwise, all of the transportation of the material all of the health and safety monitoring and all of the final disposal of the activity will be accomplished by a Health Chemistry Group under the direct supervision of our Safety Officer.

NDA_

11. State Proposed use of Radiomaterial and General Plan of Investigation:

Material is composed of 18 individual samples of (U-238 + U-235) in capsules, which have been irradiated in MTR at Arco, Idaho. Our proposed program is as follows:

a) We will receive samples from MTR by way of ANL.

b) We will store samples, for possibly 6 months, until our Hot Lab facility is completed and we can work with them in properly shielded cells and with the use of shielded manipulators.

c) When our Hot Cell facility is complete, we will move the samples into the cells, open the containers, remove the irradiated contents and examine them metallographically (measure, photograph, etc.)

NDA_

28. Describe Procedures Proposed for Monitoring and Health Protection:

The shipment will consist of 18 separate pieces in a single shipping cask (6" of lead shielding). This caskihg will be transferred to a 1 ft.^{3} cave surrounded by enouth lead to attenutate the γ radiation streaming from the shipping cask to <0.1 mr/hr on contact with the outside of the outside of the cave. The bricks will be so placed as to avoid line of sight beams thru the shield. The actual transfer will be preceded by dry runs to insure a smooth operation, it will be monitored by radiation detection instruments to insure that no one receives more than 50 mr/day for the day of the transfer or more than 300 mr/week for the week the transfer was made.

All personnel involved in the transfer will wear film badges and pocket ionization chambers to check dosage on the spot.

Once the cask of samples is in place in the cave, a roof of lead will be placed over the cave, the whole cave enclosed in a cage of heavy wire bolted to the floor. The area will be roped off and posted. The storage is in a building which has a sprinkler system for fire protection, a burglar alarm system to prevent breaking and entering and a 24 hour/day guard, beside the regular police protection afforded by the City of White Plains, New York.

After approximately 6 months, the above procedure will be reversed, the cask taken out of the cave and transferred to a hot storage facility connected with our then completed 6" of lead shielded Berkeley type hot cave. We intend to follow all of the Health Chemistry technics worked out by UCRL for their hot cell installation.

NDA_

30. Experience of Person mentioned in item 29.

He has been employed as an analytical chemist, Industrial Toxicologist and research analyst by General Electric Company for nearly 12 years, the last 4 years of which time were spent working closely with the Knolls Atomic Power Laboratory at Schenectady, New York, He worked with the Shielding Group, Liquid Metals Group and Analytical Chemistry Group. The last 2/3 of a year (1951) was spent accumulating design data for an industrial laboratory for working with medium levels of radioactivity.

For just over 3 years he was Assistant Chief, Analytical Branch, Health and Safety Laboratory, USAEC. Here his work was mainly concerned with fallout phenomena connected with weapons tests in both continental US and the Pacific Ocean weapons testing area. For the past 8 months he has been Safety Officer of this company. His duties here involve safety for all of the company's activities including our radiochemical facility. We are now authorized to receive up to 15 curies of mixed fission products, plus 0.6 curies of Co-60. We are licensed for natural Uranium and are an accountability station for S/F materials. We are currently awaiting action on our application for a license for highly enriched U + U-235 for irradiation effects studies upon nuclear reactor fuel element components.

He is currently enrolled in the Post-Graduate Medical College of New York University and has already completed courses in Radiological safety and control of Air Pollution. He is a member of the New York State Board of Standards and Appeals Advisory Committee on Radiation Protection. For the past several months his work here has involved him in a study of Hot cells or high level laboratories which included on-the-spot studies of the operation of Hot Labs at KAPL, ANL and UCRL at Berkeley, California.

As a result of this study, in fact, we have decided to adopt the Berkeley system of Hot Cell design and Containment of Contamination.

In all of his safety work, Mr. Sax reports directly to the head of the Division of Laboratories.

30 - Continued

He is author of the "Handbook of Dangerous Materials", published by the Reinhold Publishing Corporation of New York, many of the principals of chemical safety also apply to the control of radioactive contamination.

NDA_

(31) List and Describe Briefly (ratiation,shielding, respirators, ventilated hoods, remote handling equipment, etc.)

The samples will be stored in a cave of lead. They will be left in the shipping cask they arrive in until used. They will be worked with in a Berkeley type hot cell with 6" of lead (or the equivalent of Concrete,etc)

We intend to use Castle type manipulators and the same ventilation and health chemistry technics as are used at Berkeley.