



Nuclear Research Corporation

DENVILLE NUCLEAR DIVISION

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TELEPHONE: (201) 627-4200

November 27, 1979

U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

Subj: License 29-04236-01, Low Level Waste Disposal
Program

Ref: (a) USNRC bulletin 79-19 of 10 Aug 1979
(b) Nuclear Research Corp., license renewal
application of 26 Sept 1978

Enc: (1) Chapter XII, Supplement to Rules and
Regulations, NO. 041371, Rev. 0579

Gentlemen:

In reply to reference (a), Nuclear Research Corp., although it has a very low occurrence of radioactive waste generation, has prepared the enclosed Chapter XII which will supplement our "Regulations For the Use of Radioactive Materials", No. 041371, Rev 0579. This document was submitted as Appendix K to reference (b).

In addition, and in reply to reference (a), NRC offers the following information:

1. NRC maintains a current set of DOT and USNRC regulations concerning the transfer packaging and transport of low level waste material.
2. We have on hand a set of requirements for packaging low level wastes for ultimate transfer to Nuclear Engineering Co., Richland, Washington. These have been provided by the waste contractor we utilize - Teledyne Isotopes, Westwood, New Jersey.

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3. The people in this organization who are responsible for the safe transfer, packaging and transport of low-level radioactive material are the principals of the licensee Elmo J. Di Ianni, Harold J. Cooley or Fred C. Riffin.
4. Refer to enclosed supplement, Chapter XII for detailed instructions on packaging.
5. Chapter XII will be updated as new requirements occur and will also contain the latest applicable burial site regulations. The licensee principals will be so advised and all will sign for any new information added to our "Rules and Regulations" relative to transfer of low-level waste material.
6. Since the principals are the only personnel involved with generating any waste, the "in house" requirement is known that no liquid will be offered for waste disposal other than the spent pipets, syringes, ampules which will be packed in layers in absorbent material in an appropriate container provided by the waste disposal service.

Any additional training required to comply with future or changing specifications will be initiated and disseminated to the principals as in 5. above.

Other waste such as low specific activity solid waste will be disposed of according to the Teledyne Isotope Packaging Procedures for Low Specific Activity Waste.

7. As the waste disposal service provides a container (5, 30 or 55 gallon drum) an inventory sheet is also supplied for itemizing each item to be disposed of. This sheet (sample enclosed) will serve as our controller's audit function and will be kept with our Log of transfers.

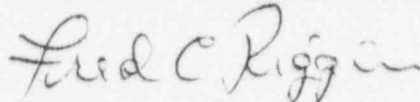
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8. No transfer of low level has been made within 60 days of the date of reference (a), consequently no audit log generated.
9. The NRC plan for packaging low level waste is submitted as the enclosed supplement to our Rules and Regulations. Answers to questions 1), 2) and 3) are as follows for the first 6 months of 1979.
 - a). No low level waste shipments were made.
 - b). Not applicable.
 - c). No liquid waste was generated.

Trusting the foregoing information satisfied the response to your letter of 10 Aug 1979, I remain

Very truly yours,

NUCLEAR RESEARCH CORPORATION
Denville Nuclear Division



Fred C. Riggin
Radiation Safety Officer

FCR/jl
Encl.

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XII PREPARATION OF LOW LEVEL WASTE FOR DISPOSAL

- A. All radioactive waste whether Special Form or Normal Form will be disposed of via an authorized service agency in their provided containers and in full compliance with their requirements for packaging. (Refer to the Teledyne Isotopes Packaging Procedures as EXHIBIT A attached).
- B. Only the named licensees are authorized to prepare and certify that all conditions for waste preparation are met as follows:
 - 1. A plastic liner is first inserted into the disposable container.
 - 2. In the event of a liquid to be disposed of, layers of non-flammable absorbent material equal to 2 times the absorbent volume must be added. The remainder of the disposal can will be filled with the absorbent material. Refer to Exhibit A.
 - 3. For low specific activity waste, follow the procedure of Exhibit A.
 - 4. For by-product material in normal or special form that exceeds the low specific activity limitations, contact Teledyne Isotopes for additional packaging instructions that will involve shielding and weight limitations.

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COMPANY/INSTITUTION

Nuclear Research Corp.

FULL ADDRESS:

Denville, NJ

Fred Ruggin

MATERIAL DESCRIPTION: RADIOACTIVE MATERIAL
(See CFR 49: 172.101) *Dr. W. K.*

DELIVER + ONLY

HAZARD CLASS: RADIOACTIVE MATERIAL

[illegible]

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION, AND ARE PACKAGED ACCORDING TO THE APPLICABLE REGULATIONS OF THE BURIAL SITE.

C OR AGREEMENT STATE LICENSE NO.

AUTHORIZED SIGNATURE

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CUSTOMER'S COPY

PACKAGING PROCEDURES FOR LOW SPECIFIC ACTIVITY RADIOACTIVE WASTE
- SOLID WASTE -

"Low specific activity material" means any of the following:

1. Uranium and Thorium ores and physical or chemical concentrates of those ores;
2. Unirradiated natural or depleted uranium or unirradiated natural thorium;
3. Tritium oxide in aqueous solutions provided the concentration does not exceed 5 millicuries per milliliter;
4. Material in which the activity is essentially uniformly distributed and in which the estimated average concentration per gram of contents does not exceed:
 - (i) 0.0001 millicuries of Group I radionuclides; or
 - (ii) 0.005 millicuries of Group II radionuclides; or
 - (iii) 0.3 millicuries of Group III or IV radionuclides.
5. Objects of non-radioactive material externally contaminated with radioactive material, provided that the radioactive material is not readily dispersible and the surface contamination when averaged over an area of one square meter, does not exceed 0.0001 millicurie per square centimeter of Group I radionuclides or 0.001 millicurie per square centimeter of other radionuclides. (49 CFR 173.389)

ALL SOLID WASTE MATERIALS MEETING THIS CRITERIA AND WHICH ARE NOT ANIMAL CARCASSES MUST BE PACKAGED AS FOLLOWS:

1. Select a 5-, 30-, or 55-gallon container.
2. Fill to capacity but not exceeding 100, 280, or 480 lbs. respectively for the 5-, 30-, or 55-gallon containers.
3. Secure cover.

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PACKAGING PROCEDURES FOR LOW SPECIFIC ACTIVITY RADIOACTIVE WASTE
- BULK LIQUIDS -

"Low specific activity material" means any of the following:

1. Uranium and Thorium ores and physical or chemical concentrates of those ores;
 2. Unirradiated natural or depleted uranium or unirradiated natural thorium;
 3. Tritium oxide in aqueous solutions provided the concentration does not exceed 5 millicuries per milliliter;
 4. Material in which the activity is essentially uniformly distributed and in which the estimated average concentration per gram of contents does not exceed:
 - (i) 0.0001 millicuries of Group I radionuclides; or
 - (ii) 0.005 millicuries of Group II radionuclides; or
 - (iii) 0.3 millicuries of Group III or IV radionuclides.
 5. Objects of non-radioactive material externally contaminated with radioactive material, provided that the radioactive material is not readily dispersible and the surface contamination when averaged over an area of one square meter, does not exceed 0.0001 millicurie per square centimeter of Group I radionuclides or 0.001 millicurie per square centimeter of other radionuclides. (49 CFR 173.389)
- ALL BULK LIQUIDS MEETING THIS CRITERIA MUST BE PACKAGED AS FOLLOWS:
- . Select the double-walled 55-gallon solid-pak drum.
 - . Remove cover from 55-gallon drum.
 - . Locate bung on the 30-gallon inner container. Loosen and remove.
 - . Keeping an account of the amount of liquid, pour the liquid into the 30-gallon inner container. (Note: Liquid must be of a pH between 6.0 and 9.0)
 - . Once the account shows 12 gallons of liquid added, stop.
 - . Replace bung and tighten.
 - . Replace cover of 55-gallon drum.

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PACKAGING PROCEDURES FOR LOW SPECIFIC ACTIVITY RADIOACTIVE WASTE
- SCINTILLATION VIALS -

"Low specific activity material" means any of the following:

1. Uranium and Thorium ores and physical or chemical concentrates of those ores;
2. Unirradiated natural or depleted uranium or unirradiated natural thorium;
3. Tritium oxide in aqueous solutions provided the concentration does not exceed 5 millicuries per milliliter;
4. Material in which the activity is essentially uniformly distributed and in which the estimated average concentration per gram of contents does not exceed:
 - (i) 0.0001 millicuries of Group I radionuclides; or
 - (ii) 0.005 millicuries of Group II radionuclides; or
 - (iii) 0.3 millicuries of Group III or IV radionuclides.
5. Objects of non-radioactive material externally contaminated with radioactive material, provided that the radioactive material is not readily dispersible and the surface contamination when averaged over an area of one square meter, does not exceed 0.0001 millicurie per square centimeter of Group I radionuclides or 0.001 millicurie per square centimeter of other radionuclides. (49 CFR 173.389)

ALL SCINTILLATION VIALS MEETING THIS CRITERIA MUST BE PACKAGED AS FOLLOWS:

1. Vials must be packaged using a 2:1 absorbancy ratio of non-flammable absorbant to liquid content.
Note: This is approximately a 4.5:1 volume ratio for fine grade Vermiculite.
2. The scintillation vials must be layered between layers of non-flammable absorbant.
3. Seal the drum.

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PACKAGING PROCEDURES FOR LOW SPECIFIC ACTIVITY RADIOACTIVE WASTE
- SMALL VOLUME LIQUID WASTE -

"Low specific activity material" means:

1. Uranium and Thorium ores and physical or chemical concentrates of those ores;
2. Unirradiated natural or depleted uranium or unirradiated natural thorium;
3. Tritium oxide in aqueous solutions provided the concentration does not exceed 5 millicuries per milliliter;
4. Material in which activity is essentially uniformly distributed and in which the estimated average concentration per gram of contents does not exceed:
 - (i) 0.0001 millicuries of Group I radionuclides; or
 - (ii) 0.005 millicuries of Group II radionuclides; or
 - (iii) 0.3 millicuries of Group III or IV radionuclides.
5. Objects of non-radioactive material externally contaminated with radioactive material, provided that the radioactive material is not readily dispersible and the surface contamination when averaged over any area of one square meter, does not exceed 0.0001 millicurie per square centimeter of Group I radionuclides or 0.001 millicurie per square centimeter of other radionuclides. (49 CFR 173.389)

Small volumes of liquids means any liquid, in any quantity, up to approximately 20 ml. per small container. This includes pipets, syringes, ampules, and other small containers having any amount of liquid at all in them.

ALL SMALL VOLUMES OF LIQUID MEETING THE ABOVE CRITERIA MUST BE PACKAGED AS FOLLOWS:

1. Select a 30 or 55-gallon container.
2. Layer the different items between layers of non-flammable absorbant (e.g. fine grade Vermiculite).
3. Fill to capacity and secure cover.

Note: The drums must contain a minimum of twice the amount of absorbant than is needed to absorb the liquid present.

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