



DEPARTMENT OF THE ARMY
UNITED STATES ARMY ELECTRONICS COMMAND
FORT MONMOUTH, NEW JERSEY 07703

104 Arch-71B
0199

IN REPLY REFER TO:

22 JAN 1968

Reference: DML:IB:NB (96856)

Mr. Nathan Bassin
Isotopes Branch, Division of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Sir:

The March 3, 1967 letter you mention, reference as above was lost in the mails and its comments were not considered in writing ECOMR-385-9. In compliance with the March 3 letter, the following action has been taken to correct ECOMR-385-9.

Appendix II, Section 1.b (2) has been corrected as follows:

(2) Paragraph 1 line 4 change "three groups" to "4 groups (ref: NBS Handbook 92 page 12)", replace (2) (a) with:

Group I Very High Hazard

Pb 210, Po 210, Ra 226, Ac 227, Th 228, Th 230, Np 237, Pu 238,
Pu 239, Pu 240, Pu 241, Pu 242, Am 241, Cm 242.

Replace (2) (b) with:

Group II High Hazard

Na 22, Ca 45, Sc 46, Co 60, Sr 90, Ru 106, I 129, I 131, Cs 137, Ce 144,
Eu 154, Ta 182, Bi 210, At 211, Ra 224, U 233.

Replace (2) (c) with:

Group III with Medium Hazard

C 14, Na 24, Si 31, P 32, S 35, Cl 36, K 42, Sc 47, V 48, Cr 51, Mn 54,
Fe 55, Fe 59, Cu 64, Zn 65, Ga 72, As 76, Rb 86, Y 90, Y 91, Zr 95, Nb 95,
Mo 99, Ru 103, Rh 105, Pd 103, Ag 105, Ag 111, Cd 109, Sn 113, Te 127,
Te 129M, Ba 140, La 140, Pr 143, Pm 147, Sm 151, Ho 166, Tm 170, Lu 177,
Re 183, Ir 190, Tr 192, Pt 191, Pt 193, An 196, An 198, Au 199, Tl 200,
Te 201, Tl 202, Tl 204, Pb 203, Rn 220, Rn 222, U 235.

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Add (2) (d):

Group IV Low Hazard

H3, Be 7, F 18, Ni 59, Zn 69, Ge 71, U 238, Natural Thorium, Natural Uranium, Noble Gases.

Appendix II, Section 1.b (3) shall be replaced with the following:

Theft or loss of radioactive material shall be reported to the RFO who will report it to the manager of the nearest Atomic Energy Commission Operations Office, immediately after its occurrence becomes known, when the lost or stolen material is in such quantities and under such circumstances that it appears a substantial hazard may result to persons in unrestricted areas (reference CFR 10 section 20.402).

The original lists of isotopes in Appendix II section 1.b. (2) and the amounts in subsection (3) were taken from Army Regulations No. 40-582 dated 14 October 1958, Section 6.a and 6.b (copy inclosed).

Appendix V, para 1. Film Badges will be corrected to read:

Each individual who enters a restricted area under such circumstances that:

a. He receives or is likely to receive, a dose in excess of the following doses during the normal performances of his duties will be assigned a permanent film badge number and wear a film badge whenever he enters a restricted area.

(1) Over 18 years of age:

300 mrem/calendar quarter - total body.
4700 mrem/calendar quarter - hands or feet.
1800 mrem/calendar quarter - skin of whole body.

(2) Under 18 years of age:

60 mrem/calendar quarter - total body.
940 mrem/calendar quarter - hands or feet.
360 mrem/calendar quarter - skin of whole body.

The above shall be computed taking into consideration the intensity of the radiation in the restricted area when the sources are in operation,

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Reference: DML:IB:NB (96856)

the occupancy factor of the individual, and the usage factor of the radioactive material. The computation will be made under circumstances which give the greatest safety factor to the individual.

b. In addition, visitors or individuals not assigned a permanent film badge will be issued a temporary film badge whenever they enter:

(1) A Radiation Area, where the radiation intensity can exceed 5 mr/hr.

(2) A High Radiation Area, where the radiation intensity can exceed 100 mr/hr.

(3) A Restricted Area when their computed exposure can exceed the values in a. (1) or a. (2) above.

Film badges must be worn only by the individual to whom they are assigned. When they are not being worn they will be stored in an area known to be free of radiation. Supervisors will request film badges from the Supervisor of Radiation Facilities. (Reference CFR 10 section 20.202).

Appendix VII Section 8a (1) has been corrected to read:

Director, Division of Compliance, Region I
U. S. Atomic Energy Commission
376 Hudson Street
New York, New York 10014

Sincerely yours,



BASIL MARKOW
Chairman,
Isotopes and Ionizing Radiation Committee

2 Incls
AR40-58
D/F to Admin Office

DISPOSITION FORM

(AR 340-15)

0199

REFERENCE OR OFFICE SYMBOL

SUBJECT

AMSEL-HL-CT-KD

Changes in ECOM Reg 385-9

TO Ch, Admin Office
Bldg 2525

FROM Dos & Cal Team
Radiac R&D Grp

DATE Mr. Markow/61714/gb

CMT 1

1. In order to comply with Atomic Energy Commission and DCS Log regulations and to renew our AEC Isotopes license, the following changes in ECOM Reg 385-9 are requested:

a. Appendix II, section 1.b. (2).

Paragraph 1, line 4 - change "three groups" to "four groups (reference NBS (National Bureau of Standards) Handbook 92, page 12)."

Replace (2) (a) with:

Group I Very High Hazard

Pb 210, Po 210, Ra 276, Ac 227, Th 228, Th 230, Np 237, Pu 239, Pu 240, Pu 241, Pu 242, Am 241, Cm 242.

Replace (2) (b) with:

Group II High Hazard

Na 22, Ca 45, Sc 46, Co 60, Sr 90, Ru 106, I 129, I 131, Cs 137, Ce 144, Eu 154, Ta 182, Bi 210, At 211, Ra 224, U 233.

Replace (2) (c) with:

Group III Medium Hazard

Cl 14, Na 24, Si 31, P 32, S 35, Cl 36, K 42, Sc 47, V 48, Cr 51, Mn 54, Fe 55, Fe 59, Cu 64, Zn 65, Ga 72, As 76, Rb 86, Sr 89, Y 90, Y91, Zr 95, Nb 95, Mo 99, Ru 103, Rh 105, Pd 103, Ag 105, Ag 111, Cd 109, Sn 113, Te 127, Te 129M, Ba 140, La 140, Pr 143, Pm 147, Sm 151, Ho 166, Tm 170, Lu 177, Re 183, Ir 190, Tr 192, Pt 191, Pt 193, Au 196, Au 198, Au 199, Tl 200, Te 201, Tl 202, Tl 204, Pb 203, Rn 220, Rn 222, U 235.

Add: (2) (d)

Group IV Low Hazard

H3, Be7, F 18, Ni 59, An 69, Ge 71, U 238, Natural Thorium, Natural Uranium, Noble Gases.

Retain paragraph beginning with "Isotopes not listed should be....."

b. Appendix II, section 1.b. (3); replace entirely with the following:

Incl 1/2

DA FORM 2496
FEB 62

REPLACES DD FORM 96, EXISTING SUPPLIES OF WHICH WILL BE ISSUED AND USED UNTIL 1 FEB 63 UNLESS SOONER EXHAUSTED. * U.S. GOVERNMENT PRINTING OFFICE: 1963 O-707-911

Theft or loss of radio active material shall be reported to the RPO who will report it to the manager of the nearest Atomic Energy Commission Operations Office, immediately after its occurrence becomes known, when the lost or stolen material is in such quantities and under such circumstances that it appears a substantial hazard may result to persons in unrestricted area (reference CFR 10 section 20.402).

c. Appendix V, section 1.; replace entirely with the following:

Each individual who enters a restricted area under such circumstances that:

a. He receives or is likely to receive, a dose in excess of the following doses during the normal performances of his duties will be assigned a film badge number and wear a film badge wherever he enters a restricted area.

(1) Over 18 years of age:

300 mrem/calendar quarter - total body.
4700 mrem/calendar quarter - hands or feet.
1,800 mrem/calendar quarter - skin of whole body.

(2) Under 18 years of age:

60 mrem/calendar quarter - total body.
940 mrem/calendar quarter - hands or feet.
360 mrem/calendar quarter - skin of whole body.

The above shall be computed taking into consideration the intensity of the radiation in the restricted area when the sources are in operation, the occupancy factor of the individual, and the usage factor of the radioactive material. The computation will be made under circumstances which give the greatest safety factor to the individual.

b. In addition, visitors or individuals not assigned a permanent film badge will be issued a temporary film badge whenever they enter:

(1) A Radiation Area, where the radiation intensity can exceed 5 mr/hr.

(2) A High Radiation Area, where the radiation intensity can exceed 100 mr/hr.

(3) A Restricted Area when their computed exposure can exceed the values in a. (1) or a. (2) above.

Film badges must be worn only by the individual to whom they are assigned. When they are not being worn they will be stored in an area known to be free of radiation. Supervisors will request film badges from the Supervisor of Radiation Facilities.

(reference CFR10 section 20.202)

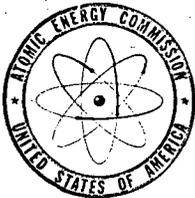
d. Appendix VII 8. a. (1); replace with the following:

Director, Division of Compliance, Region I
U. S. Atomic Energy Commission
376 Hudson Street
New York, N. Y. 10014

2. It is also requested that previous pen and ink corrections also be included in the correction version of ECOMR-385-9.



BASIL MARKOW
Chairman,
Isotopes & Ionizing Radiation Committee



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:

DML:IB:NB (96856)

NOV 30 1967

Commanding Officer
U. S. Army Electronics Command
Fort Monmouth, New Jersey 07703

Dear Sir:

This refers to your application for renewal of License No. 29-01022-06.

Appendix II of ECOMR 385-9 relates to the categories of radiation hazards of radioactive materials. Several months ago we were asked by the Office of the Deputy Chief of Staff for Logistics to comment on this particular document. On March 3, 1967, we sent a letter to DCSLOG with our comments. These comments do not appear to have been taken into consideration. In order to continue our review of the application, we need clarification of the matters which we discussed in our letter of March 3, 1967.

Sincerely yours,

A handwritten signature in cursive script that reads "Nathan Bassin".

Nathan Bassin
Isotopes Branch
Division of Materials Licensing

Enclosure:
Cy ltr dtd 3/3/67 to DCSLOG

cc: DCSLOG/PEMA, w/cy encl.

MAR 3 1967

DML:IB:NE

Department of the Army
Deputy Chief of Staff for Logistics
Washington, D. C. 20310

Attention: Chief, FEMA Execution Division

Gentlemen:

This refers to your letter of February 2, 1967, which requested comments on the proposed Electronics Command Regulation No. 385-9.

Appendix II, Section 1.b.(2) classifies isotopes according to the degree of hazard. Subsection (3) specifies the quantity for which hazardous exposure should be considered a definite possibility if the radioactive material is involved in physical disappearance, theft, accident, fire, or other incident. The quantities specified are several orders of magnitude higher than normally used for designating hazardous quantities. In this regard, please refer to NBS Handbook No. 92. Please clarify the source of the designation of the specified quantities.

Appendix V, Section 1, specified the circumstances under which film badges should be worn. Since at the beginning of any calendar quarter it may not be possible to determine how much radiation a person may receive, this section should be clarified to indicate how the Radiation Protection Officer or the Radioisotope Committee determines when personnel shall wear film badges.

Appendix VII, Section 8, specifies that notification of incidents will be sent to the Manager, New York Operations Office, Atomic Energy Commission. This should be changed to Director, Division of Compliance, Region I, U. S. Atomic Energy Commission, 376 Hudson Street, New York, New York, 10014.

Sincerely yours,

Nathan Bessin
Isotopes Branch
Division of Materials
Licensing

(c) Collect all urine from that time to and including the corresponding hour the following day. ALL URINE MUST BE COLLECTED. LOSS OF A SIGNIFICANT AMOUNT MAY RENDER THE SAMPLE USELESS.

d. Samples will be held by the post surgeon pending disposition instructions from The Surgeon General. When so directed samples will be forwarded by the most expeditious means to the following address:

THRU: Commanding General
Walter Reed Army Medical Center
Washington 12, D. C.

TO: Director
Walter Reed Army Institute of Research
Walter Reed Army Medical Center
ATTN: Department of Biophysics

8. **Overexposure.** If an overexposure to ionizing radiation has been received or radioactive material has been ingested, inhaled, or absorbed through the skin, an appropriate entry will be made on DD Form 1141 in accordance with AR 40-431. A brief description of the condition or act which resulted in the overexposure will be attached to the individual DD Form 1141 (Record of Exposure to Ionizing Radiation).

9. **Post surgeon.** Since the post surgeon is responsible for the clinical management of each case, the foregoing instructions are not to be interpreted as restrictive with regard to such management.

[AG 7203 (21 Feb 58) MEDCA]

By Order of *Wilber M. Buckner*, Secretary of the Army:

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official:

HERBERT M. JONES,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army: C.

To be distributed as needed to all installations, activities located off an installation, and to all units and headquarters down to and including divisions, and units and headquarters of comparable size.

NG: State AG (3).

USAR: None.

TAGO 1902B

U. S. GOVERNMENT PRINTING OFFICE: 1958

ARMY REGULATION

No. 40-582

HEADQUARTERS,

DEPARTMENT OF THE ARMY

WASHINGTON 25, D. C., 14 October 1958

MEDICAL SERVICE

EVALUATING AND REPORTING INTERNAL EXPOSURE TO
RADIOACTIVE MATERIALS

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1. **Purpose.** These regulations prescribe the minimum action to be taken in the event of an incident involving the internal exposure of personnel to radioactive materials, and the conditions under which the Surgeon General will be notified of such exposure of personnel. Such reports are for the sole purpose of insuring that the most prompt and appropriate medical attention is provided to personnel of the Army.

2. **Application.** These regulations are applicable to all commands, installations, and activities in the Department of the Army employing the radioactive materials listed in paragraph 15, AR 40-580, plus Plutonium 239, Radium 226, Thorium (natural), Uranium (natural), Uranium 233, and Uranium 234-Uranium 235. The provisions of these regulations are not intended to conflict with nor supersede established procedures in regard to the handling of nuclear weapons.

3. **Definition.** For the purpose of these regulations internal exposure is defined as that wherein there is reasonable evidence to suspect that radioactive material has been ingested, inhaled, or absorbed through the skin.

4. **Standing operating procedures (SOP).** Each installation where radioisotopes are employed shall develop and keep current an SOP to be implemented in the event of internal exposure to radioactive materials. The SOP shall prescribe the action covering at least the following:

- Evacuation of personnel from immediate area.
- Procedure for medical treatment and/or evacuation of suspected contaminated individuals. See paragraph 7 for instructions relative to urine collection and handling.
- Personnel decontamination.
- Collection and decontamination of film badges worn by contami-

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ated individuals. Film packets shall be shipped to Lexington Signal Depot, Ky., by air mail special delivery. Lexington Signal Depot will be alerted that the film packets are arriving.

e. Assessing extent of contamination.

f. Property decontamination.

5. **Reporting.** Commanders of installations and off-post activities where radioisotopes are employed, will designate the post surgeon or his representative, or in the absence of AMEDS personnel, another appropriate individual who will notify The Surgeon General, Department of the Army, Washington, D. C., ATTN: MEDCE-OH, by telegraphic means immediately after it has been determined that a probable internal exposure has occurred. This notification is not to be used in lieu of or to supplement DA Form 285 (Accident) nor is it to be used to fix responsibility for an accident. This notification is in addition to reports required of holders of byproduct material licenses by paragraph 20.403, 10CFR20. In the event that a radioisotope in Group III, paragraph 6a (3) is involved, The Surgeon General, Department of the Army (Preventive Medicine Division) will be notified immediately by telephone because of the urgency of the treatment within 24 hours. Telephone notifications will be confirmed by telegraphic notifications. Notifications of hazardous exposure to radioactive material will include the following (exempt report, par. 17k, AR 335-15):

a. Approximate time and the date of incident.

b. Strength of source, element, chemical and physical form.

c. Number of individuals contaminated or overexposed or suspected of being contaminated or overexposed. Include a statement indicating the treatment rendered (or that no treatment has been rendered).

d. Extent of individual contamination as determined by immediate monitoring.

6. **Classification of isotopes.** a. The degree of the hazard resulting from exposure to an isotope is dependent upon its action in the human body. To ascertain the extent of the possible hazard, representative isotopes are divided into three groups as follows:

(1) Group I—Slight hazard

Na²⁴, K⁴², Cu⁶⁴, Mn⁵², As⁷⁶, As⁷⁷, Kr⁸⁵, Hg¹⁹⁷

(2) Group II—Moderately dangerous

C¹⁴, P³², Na²², S³⁶, Cl³⁶, Mn⁵⁴, Fe⁵⁹, Co⁶⁰, Sr⁹⁰, Cb⁹⁵, Ru¹⁰⁶, Ru¹⁰⁶, Te¹²⁷, Te¹²⁹, I¹³¹, Cs¹³⁷, Ba¹⁴⁰, La¹⁴⁰, Ce¹⁴¹, Pr¹⁴³, Nd¹⁴⁷, Au¹⁹⁶, Au¹⁹⁹, Hg²⁰³, Hg²⁰⁶

(3) Group III—Very dangerous

H³, Ca⁴⁵, Fe⁵⁵, Sr⁹⁰, Y⁹¹, Zr⁹⁵, Ce¹⁴⁴, Pm¹⁴⁷, Bi²¹⁰

Isotopes not listed should be classed according to their biologic half-lives, energy of radiation, and action in the human body. If the action within the human body is not known with reasonable certainty, the isotope should be classed according to the best determination which can be made and assigned to a group classification which will provide an appropriate margin of safety.

b. Hazardous exposure should be considered a definite possibility when the following amounts of the listed isotopes are involved in any physical disappearance, alleged theft, accident, fire or other incident:

Group I—500 millicuries

Group II—50 millicuries

Group III—5 millicuries

7. **Urine collection and handling.** a. Where there is reason to believe that an individual has been internally contaminated with radioactive material, a 24-hour urine sample will be initiated as soon as possible. A 24-hour urine sample is defined as follows:

All urine voided in a 24-hour period will be considered a 24-hour sample. For example, if urine is voided at 0800 and discarded, then the sample will consist of all urine voided and collected from that time up to and including 0800 the following day.

b. Samples will be collected in polyethylene bottles (preferably 2 1/2 liters), appropriately identified as to name of individual and inclusive dates of sampling. The average amount of urine excreted per individual per day is 1.5 liters. It is recommended that a number of bottles be stocked by installations using radioisotopes to cover an emergency, based on the average number of individuals involved in any one operation involving the use of isotopes. Benzoic acid will be used as a preservative in the ratio of 1 gram of Benzoic acid per liter of urine.

c. A 3- by 5-inch index card or tag will be attached to the bottle with the following information:

(1) *Front.*

Name, grade, and service number

Date of incident

Inclusive dates of collection

Suspected isotope

(2) *Reverse.*

A 24-hour urine sample will be collected as follows:

(a) Wash hands *before* collecting a portion of the sample.

(b) Void urine at 0800 (or any other convenient time) and discard it. Do not collect it in the bottle.