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### TITLE 10 - ATOMIC RHERGY

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### CHAPTER I - ATOMIC ENERGY COMMISSION

PART 20 - STANDARDS FOR PROTECTION AGAINST RADIATION

NOTICE OF PROPOSED RULE MAKING

RADIOACTIVITY IN EFFLUENTS TO UNRESTRICTED AREAS

STATEMENT OF CONSIDERATIONS

On September 7, 1960, the Commission published in the Federal Register comprehensive amendments of 10 CFR Part 20 which became effective January 1 1961. The amendments were designed to bring the Commission's radiation protection standards into accord with the recommendations of the Federal Radiation Council for normal peacetime operations as approved by the President on May 13, 1960, and the Recommendations of the National Committee on Radiation Protection as published in National Bureau of Standards Handbook 59 with addendum and Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure."

The amendments included a comprehensive revision of the limits specified in Part 20 Appendix B; Concentrations in Air and Water Above Natural Background. The limits specified in Table II, Columns I and 2 of the Appendix are concentrations of radioactive material in effluents which, pursuant to \$20,106(b), may be released by licensees into unrestricted areas without specific approval of the Commission.

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For those activities where it is not practical to limit concentrations to Appendix B, Table II limits, averaged over a period of one year, \$20.106(a) presently provides that an applicant may propose concentration limits of radioactive materials in effluents to unrestricted areas higher than the Appendix B, Table II limits, averaged over a period of one year. The Commission will approve the proposed limits if the applicant demonstrates that, as a result of environmental dilution, dispersion and other factors, it is not likely that any individual will be exposed to concentrations in excess of the limits specified in Appendix B, Table II, averaged over a period of one year.

In the Memorandum for the President dated September 13, 1961, the Federal Radiation Council made further recommendations on Radiation Protection Guides for certain body organs in relation to exposure of population groups for normal peacetime operations, as indicated in Table I below:

| TABLE | Ι |
|-------|---|
|       |   |

| Organ            | RPG for<br>Individuals   | RPG for average of<br>suitable sample of<br>exposed population<br>groups   |
|------------------|--|--|
| Thyroid          | 1.5 rem per year   | 0.5 rem per year   |
| Bone Marrow      | 0.5 rem per year   | 0.17 rem per year  |
| Bone             | 1.5 rem per year   | 0,5 rem per year   |
| Bona (Alternate) | 0.003 micrograms of<br>Ra 226 in the adult<br>skeleton or the<br>biological equivalent<br>of this amount of<br>Ra 226. | 0.001 micrograms of<br>Ra 226 in the adult<br>skeleton or the<br>biological equivalent<br>of this amount of<br>Ra 226. |

### RADIATION PROTECTION GUIDES FOR CERTAIN BODY ORGANS IN RELATION TO EXPOSURE OF POPULATION GROUPS

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The Council also recommended graded scales of action (based on ranges of transient rates of daily intake) as shown in Table II below. The purpose of these actions is to provide reasonable assurance that average rates of intake by a suitable sample of an exposed population group averaged over the sample and averaged over periods of time of the order of one year do not exceed the upper value of Range II.

### TABLE II

| Ranges of Transient<br>Rates, of Daily Intake |   | Graded Scale of Action   |
|---|---|--|
| Range I                                       | , | Periodic confirmatory<br>surveillance as necessary                     |
| Range II .                                    |   | Quantitative surveillance<br>and routine control                       |
| Range III                                     |   | Evaluation and application of additional control measures as necessary |

### GRADED SCALE OF ACTION

Specific recommendations were made on ranges of transient rates of intake (micromicrocuries per day) for use in graded scale of actions summarized in Table II for the radionuclides radium 226, iodine 131, strontium 90 and strontium 89. These rates of intake are shown in Table III below, and are based on the guides in Table I for radium 226 and iodine 131, and on one-third the guide values for strontium 90 and strontium 89.

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### TABLE IT

RANGES OF TRANSIENT RATES OF INTAKE (MICROMICROCURIES PER DAY) FOR USE IN GRADED SCALE OF ACTIONS SUMMARIZED IN TABLE II

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| Radionuclides | Range I  | Range II   | Range III     |    |
|---------------|--|------------|---------------|----|
| Radium 226    | 0 - 2  | 2 - 20     | 20 - 200      | •  |
| Iodine 131 1/ | <b>0</b> - 10  | 10 - 100   | 100 - 1000    |    |
| Strontium 90  | 0 - 20   | 20 - 200   | 200 - 2000    | 14 |
| Strontium 89  | <b>0 - 200</b>   | 200 - 2000 | 2000 - 20,000 | ,  |
| 71            | and the second |            |               | 4  |

In the case of iodine 131, the suitable sample would include only small children. For adults, the radiation protection guides for the thyroid would not be exceeded by rates of intake higher by a factor of 10 than those applicable to small children.

The amendment of 10 CFR Part 20 proposed herein implements the recommendations of the September 13, 1961, Memorandum for the President as they pertain to release of effluent containing radioactive materials from AEC-licensed activities in the following ways:

(a) It would incorporate into Part 20 revised concentration limits (based on FRC recommendations) for radium 226, iodine 131, strontium 89 and strontium 90 in soluble form (denoted by "S") that would govern the release by licensees of these radionuclides into unrestricted areas;

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(b) It would add to Part 20 a provision relating to limitations, which may be imposed in certain circumstances on the gross quantity of radioactive material released from a licensed activity in specified intervals of time. Such quantity limitations will be in addition to and concurrent with limitations on concentrations.

The numerical guidance by the Federal Radiation Council on rates of intake, Table III, applies to the average intake of a "suitable sample" of an exposed population group at the point of intake. Practical considerations in the regulatory control of the release of radioactive materials to the environment by Commission licensees require that the numerical guidance be converted into regulatory limits specified as concentrations of isotopes in effluent streams, and in some cases, as quantity limits on the total cumulative quantity released in specified intervals of time applicable to the boundary of the restricted area.

The concentrations of radioactive materials in effluents, specified in 10 CFR Part 20, Appendix B, Table II, may be released by a licensee without specific approval by the ARC. With the exception of the proposed limits for iodine 131, strontium 89, strontium 90, and radium 226, these values as now written are one-tenth of the limits for continuous occupational exposure, 168 hours per week, as recommended for individuals in the general population by the National Committee on Radiation Protection in NBS Handbook 69.

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Application of Part 20 Appendix B limits including the proposed new values for iodine 131, strontium 89, strontium 90, and radium 226 would in mest cases meet the recommended guides of the Federal Radiation Council. The concentration limits are derived to protect individuals in the general population from exposure to radiation as a result of intake of radioactivity through air and water. However, under certain circumstances, this intake may be augmented by concentration of radioactivity in the food chain. Therefore the amendment proposed herein provides that under certain circumstances the Commission may find it necessary to impose limits on the total quantity of radioactive material discharged over a given period of time, in addition to the concentration limits on radioactivity in effluents. For example, as may occur in the case of certain reactor fuel chemical reprocessing plants, such a quantity limit may be necessary if the average daily intake of iodine 131 from air, water, and food by a suitable sample of an exposed population group is likely to exceed that intake resulting from continuous exposure to air or water at one-third the proposed Appendix B, Table II limits. The criterion applied in limiting the gross quantity of radioactivity discharged in effluents in specific cases is designed to meet the FRC recommendation that the average intake by a suitable sample of the exposed population group is one-third the limit for individuals in the population.

Daily intakes recommended by the FRC (Table III, Range II upper binit) were used to derive a concentration limit for iodine 131, radium 226, strontium 89, and strontium 90, tobe applied at the boundary of the restricted area. This procedure is consistent with the development of

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other values in Appendix B, Table II, which apply to individuals in the population. Daily intake volumes of  $2 \times 10^7$  milliliters of air and  $2.2 \times 10^3$  milliliters of water (fluid water plus water content of food) for a standard man were used to derive the limit for strontium 90, strontium 89, and radium 226. Daily intake volumes for young children of  $3 \times 10^6$  milliliters of air and  $1 \times 10^3$  milliliters of water were used to derive the concentration limits for iodine 131,

The procedure under \$20.106 for a licensee to propose limits on concentrations of radioactive material in effluents in excess of Appendix B limits would be amended to specify more explicitly the appropriate kinds of information that might be required in support of an application.

Criteria for approval of proposed limits higher than those of Appendix B have also been amended to require the applicant to demonstrate that he has taken reasonable steps to minimize the radioactivity discharged in the effluent streams.

The conditions specified in the proposed amendment are consistent with the recommendations of the Federal Radiation Council in the judgment of the Commission in that the exposure received by an individual from radioactive material discharged in effluents in accord with the limitations proposed herein is unlikely to exceed the FRC's radiation protection guides.

Based on present licensing and compliance information available to the Commission, it appears that all activities licensed by the Commission are presently operating and can continue to operate within the criteria proposed in this amendment,

Pursuant to the Atomic Energy Act of 1954, as amended, and the Administrative Procedure Act of 1946, notice is hereby given that adoption of the following amendment of 10 CFR Part 20 is contemplated. All interested persons who desire to submit written comments or suggestions in connection

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with the proposed amendment should send them to the Secretary, United States Atomic Energy Commission, Washington 25, D. C., within 60 days after publication of this notice in the Federal Register. Comments received after that period will be considered if it is practicable to do so, but assurance of consideration cannot be given except as to comments filed within the period specified.

10 CFR Part 20 [Amendment]

1. Section 20.106 is amended to read as follows:

"Section 20.106 - Radioactivity in effluents to unrestricted areas.

(a) Except as authorized by the Commission pursuant to \$20.302, or paragraphs (b) and (c) of this section, a licensee shall not possess, use, or transfer licensed material in such a manner as to release into air or water in any unrestricted area any concentration of radioactive material in excess of any limit specified in Appendix B, Table II, of this part. For purposes of this section, concentrations may be averaged over a period not greater than one year.

(b) There may be included in any application for a license, or for amendment of a litense, proposed limits (on concentrations of licensed and other radioactive material released into air or water in unrestricted areas as a result of the applicant's proposed activities) which are higher than the concentration limits specified in paragraph (a) of this section. (c) The Commission will approve the limits proposed pursuant to paragraph (b) of this section if the applicant demonstrates:

(1) That the applicant has taken reasonable steps to minimize the radioactivity discharged in the effluent streams; and

(2) That it is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to concentrations of radioactive material in air or water exceeding the limits specified in Appendix B, Table II of this part.

(d) An application for higher limits pursuant to paragraph (b) should include, as appropriate, items such as:

(1) Information as to flow rates, total volumes of effluent, the peak concentration of each radionuclide in the effluent, and the concentration of each radionuclide in the effluent averaged over a period of one year at the point where the effluent leaves stack, tube, pipe, or similar conduit;

(2) A description of the properties of the effluents, including:

(i) chemical composition;

(ii) physical characteristics, including suspended solids
content in liquid effluents, and nature of gas or serosol for
air effluents;

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(111) the hydrogen ion concentrations (pH) of liquid effluents; and

(iv) the size range of particulates in air effluents containing aerosols or particles.

(3) A description of the anticipated human occupancy in the unrestricted area where the highest concentration of radioactive material in the effluent is expected or, in the case of a river or other stream, a description of the first point of use of the water downstream from the point of release of the effluent.

(4) Information as to the highest concentration of each radionuclide in air at any point of human occupancy in an unrestricted area, or in water at the first point of use of water in the unrestricted area. Anticipated concentrations averaged over a period of one year should be included.

(5) The background concentration of radionuclides in the receiving river or other stream prior to the release of liquid effluent.

(6) A description of the environmental monitoring equipment, including sensitivity of the system  $y_{ij}$  and procedures and calculations to determine concentrations of radionuclides in the unrestricted area and any possible reconcentration of radionuclides.

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(7) A description of the waste treatment facilities and procedures used to reduce the concentration of radionuclides in effluents prior to their release.

(e) For purposes of this section, the limits specified shall apply at the boundary where the material leaves the restricted area. Where the radioactive material is discharged through a conduit shuch as a stack, tube, or pipe, the determinations may be made by measuring concentrations at the point where the material leaves the conduit. Where such conduit discharges within the restricted area, appropriate assumptions relative to environmental dilution and dispersion may be used to determine concentrations at the points where such material leaves the restricted area.

(f) In addition to limits on concentrations in effluent streams, the Commission may impose limits on the gross quantity of radioactive material released in air or water in a specified period of time as may be appropriate if it appears likely that the daily intake, averaged over a period not exceeding one year, of radioactive material from air, water, and food by a suitable sample of an exposed population group would otherwise exceed the daily intake resulting from continuous exposure to air or water containing one-third the concentration of radioactive materials specified in Appendix B, Table II of this part.

(g) The provisions of this section do not apply to disposal of radioactive material into sanitary sewerage systems which is governed by \$20.303."

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2. Appendix B, "Concentrations in Air and Water Above Natural Background" Table II, Column I and Column 2 is amended by deleting the concentration limits appearing in Table II, Column I and Column 2 for iodine (53)  $I^{131}S$ ; radium (88) Ra<sup>226</sup>S; strontium (38) Sr<sup>90</sup>S and Sr<sup>89</sup>S and substituting therefor the following limits:

| Element<br>(Atomic Number) | Isotope                    | 1                | I<br>Column I       | Cable II<br>Column II |
|----------------------------|----------------------------|------------------|---------------------|-----------------------|
|                            | ·····                      |                  | Air uc/ml           | Water uc/ml           |
| Iodine (53)                | 1 <sup>131</sup> s         | , <sup>1</sup> · | $1 \times 10^{-10}$ | $3 \times 10^{-7}$    |
| Strontium (38)             | -S <b>r<sup>89</sup> S</b> | Ê.               | $3 \times 10^{-10}$ | $3 \times 10^{-6}$    |
|                            | 51 <sup>90</sup> S         |                  | $3 \times 10^{-11}$ | $3 \times 10^{-7}$    |
| Radium (88)                | Ra <sup>226</sup> S        | Ι.               | $3 \times 10^{-12}$ | 3 x 10 <sup>-8</sup>  |
| Radium (88)                | Ra <sup>226</sup> S        | 1.               | $3 \times 10^{-12}$ |                       |

<sup>1</sup> Soluble (s)

(SEC. 161, 68 Stat. 948; 74 U.S.C. 2201)

Dated at Washington, D. C., the <u>4th</u> day of <u>September</u>, 1963.

FOR THE ATOMIC ENERGY COMMISSION

0.00 Secretary

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( Reprint from 29 Federal Register, 14434, October 21, 1964 )

# Title 10—ATOMIC ENERGY

Chapter I—Atomic Energy Commission

#### PART 20—STANDARDS FOR PROTEC-TION AGAINST RADIATION

#### Radioactivity in Effluents to Unrestricted Areas

On September 17, 1963, the Commission published for public comment a proposed amendment of 10 CFR Part 20 which would revise § 20.106 and would revise Appendix "B" to Part 20 with respect to limits on release of certain radioactive materials into air or water in unrestricted areas.

The Statement of Considerations published in the FEDERAL REGISTER of September 17, 1963 (28 F.R. 10170) set forth a detailed discussion of the background and basis for the proposed amendment.

The amendment implements the recommendations of the September 13, 1961, Federal Radiation Council Memorandum for the President as they pertain to the release of effluent containing radioactive material from AEC-licensed activities in the following ways:

a. It would incorporate into Part 20 revised concentration limits based on FRC recommendations, for radium 226, iodine 131, strontium 89, and strontium 90 that would govern the release by licensees of these radionuclides into unrestricted areas. The limits for radium 226, and strontium 90 are less restrictive by a factor of 3. The limits for strontium 89 in air and water and for iodine 131 in air are more restrictive by a factor of 3, and the limit for iodine 131 in water is more restrictive by a factor of 7, than the present Part 20 limits.

b. It would add to § 20.106 a provision relating to limitations on the gross quantity of radioactive material released from a licensed activity in specified periods of time that will in specific circumstances be in addition to and concurrent with limitations on concentrations.

c. It would amend § 20.106 to require more specific information in support of applications for authority to release concentrations of radioactive material in effluents which exceed Part 20, Appendix "B" Table II limits.

d. It would amend criteria for approval of proposed limits higher than the Part 20 Appendix "B" limits to require

the applicant to demonstrate that he has taken reasonable steps to minimize the radioactivity discharged in the effluent streams.

The amendment published below is essentially as set forth in the proposed rule, although several minor revisions have been made for clarity and completeness. This revision reflects Commission consideration of the comments and suggestions received in response to the notice of proposed rule making. A number of language changes have been made, proposed paragraphs (b) and (c) have been combined, and the subsequent paragraphs have been relettered.

Paragraph 20.106(c) has been modified to implement § 20.106(b) by stating that an application for higher concentration limits shall make the demonstrations required by § 20.106(b).

The second sentence of § 20.106(d) has been modified to eliminate any implication that determination of the concentration discharged through a conduit must be made by measurement at the point of discharge. The modified language would allow concentrations at the point at which material leaves a conduit to be determined from measurement at other points along the conduit or from other known data. If the concentration at the end of a conduit through which radioactive material is discharged is determined to be within the limits specified in § 20.106(a), the licensee has complied with the limits on concentrations of radioactive material in effluents to unrestricted areas. This provision is consistent with § 20.106(c) of the presently effective regulation.

The Commission is also amending § 20.305, *Treatment or disposal by incineration*, to refer to the appropriate paragraph, (b), in the revised § 20.106.

The concentration limits for the other isotopes of • iodine listed in Appendix "B", Table II, 10 CFR Part 20, have been revised to make them consistent with the intake guides recommended by the FRC for iodine 131, taking into account the effective half-life and absorbed radiation energy of the individual iodine radionuclides.

Pursuant to the Atomic Energy Act of 1954, as amended, and the Administrative Procedure Act of 1946, the following amendment of Title 10, Chapter I, Part 20, "Standards for Protection Against Radiation", is published as a document subject to codification to be effective thirty (30) days after publication in the FEDERAL RECISTER.

1. 10 CFR § 20.106 is amended to read as follows:

§ 20.106 Radioactivity in effluents to unrestricted areas.

(a) A licensee shall not possess, use, or transfer licensed material so as to release to an unrestricted area radioactive material in concentrations which exceed the limits specified in Appendix "B", Table II of this part, except as authorized pursuant to § 20.302 or paragraph (b) of this section. For purposes of this section concentrations may be averaged over a period not greater than one year.

(b) An application for a license or amendment may include proposed limits higher than those specified in paragraph (a) of this section. The Commission will approve the proposed limits if the applicant demonstrates:

(1) That the applicant has made a reasonable effort to minimize the radioactivity contained in effluents to unrestricted areas; and

(2) That it is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to concentrations of radioactive material in air or water exceeding the limits specified in Appendix "B", Table II of this part.

(c) An application for higher limits pursuant to paragraph (b) of this section shall include information demonstrating that the applicant has made a reasonable effort to minimize the radioactivity discharged in effluents to unrestricted areas, and shall include, as pertinent:

(1) Information as to flow rates, total volume of effluent, peak concentration of each radionucilde in the effluent, and concentration of each radionucilde in the effluent averaged over a period of one year at the point where the effluent leaves a stack, tube, pipe, or similar conduit:

(2) A description of the properties of the effluents, including:

(i) chemical composition;

 (ii) physical characteristics, including suspended solids content in liquid effluents, and nature of gas or aerosol for air effluents;

(iii) the hydrogen ion concentrations

(p<sup>H</sup>) of liquid effluents; and

(iv) the size range of particulates in effluents released into air.

(3) A description of the anticipated human occupancy in the unrestricted area where the highest concentration of radioactive material from the effluent is expected, and, in the case of a river or stream, a description of water uses downstream from the point of release of the effluent.

(4) Information as to the highest concentration of each radionuclide in an unrestricted area, including anticipated concentrations averaged over a period of one year:

(i) In air at any point of human occupancy; or

(ii) In water at points of use downstream from the point of release of the effluent.

(5) The background concentration of radionuclides in the receiving river or stream prior to the release of liquid effluent.

(6) A description of the environmental monitoring equipment, including sensitivity of the system, and procedures and calculations to determine concentrations of radionuclides in the unrestricted area and possible reconcentrations of radionuclides.

(7) A description of the waste treatment facilities and procedures used to reduce the concentration of radionuclides in effluents prior to their release.

(d) For the purposes of this section the concentration limits in Appendix "B", Table II of this part shall apply at the

boundary of the restricted area. The concentration of radioactive material discharged through a stack, pipe or similar conduit may be determined with respect to the point where the material leaves the conduit. If the conduit discharges within the restricted area, the concentration at the boundary may be determined by applying appropriate factors for dilution, dispersion, or decay between the point of discharge and the boundary.

(e) In addition to limiting concentrations in effluent streams, the Commission may limit quantities of radioactive materials released in air or water during a specified period of time if it appears that the daily intake of radioactive material from air, water, or food by a suitable sample of an exposed population group, averaged over a period not exceeding one year, would otherwise exceed the daily intake resulting from continuous exposure to air or water containing one-third the concentration of radioactive materials specified in Ap-pendix "B", Table II of this part. (f) The provisions of this section do

not apply to disposal of radioactive material into sanitary sewerage systems, which is governed by § 20.303

2. 10 CFR Part 20, Appendix "B", "Concentrations in Air and Water Above Natural Background", Table II, Column 1 and Column 2, is amended by deleting the concentration limits appearing in Table II, Column 1 and Column 2 for iodine (53), I<sup>120</sup>S, I<sup>130</sup>S, I<sup>131</sup>S, I<sup>132</sup>S, I<sup>133</sup>S, <sup>1131</sup>S, I<sup>135</sup>S; radium (88) Ra<sup>220</sup>S; strontium (38), Sr<sup>90</sup>S and Sr<sup>80</sup>S and substituting therefor the following limits:

|                               | Isotope <sup>1</sup>  | Table II   |  |  |
|-------------------------------|---|--|--|--|
| Element (atomic<br>number)    |   | Column 1<br>air<br>(uc/ml)   | Column 2<br>water<br>(uc/ml)   |  |
| Iodine (53)                   | 1126S<br>1129S<br>1131S<br>1132S<br>1133S<br>1133S<br>1134S     | $9 \times 10^{-11}$<br>$2 \times 10^{-11}$<br>$1 \times 10^{-10}$<br>$3 \times 10^{-9}$<br>$4 \times 10^{-10}$<br>$6 \times 10^{-9}$ | $3 \times 10^{-7}$<br>$6 \times 10^{-8}$<br>$3 \times 10^{-7}$<br>$8 \times 10^{-6}$<br>$1 \times 10^{-6}$<br>$2 \times 10^{-5}$ |  |
| Strontium (38)<br>Radium (88) | Sr <sup>50</sup> S<br>Sr <sup>90</sup> S<br>Ra <sup>226</sup> S | $1 \times 10^{-10}$<br>$3 \times 10^{-10}$<br>$3 \times 10^{-11}$<br>$3 \times 10^{-12}$   | 4×10-4<br>3×10-7<br>3×10-7<br>3×10-8   |  |

1 Soluble (S).

3. 10 CFR, § 20.305 is amended to read as follows:

§ 20.305 Treatment or disposal by incineration.

No licensee shall treat or dispose of licensed material by incineration except as specifically approved by the Commission pursuant to §§ 20.106(b) and 20.302.

(Sec. 161, 68 Stat. 948; 42 U.S.C. 2201)

Dated at Washington, D.C., this 5th day of October 1964.

For the Atomic Energy Commission.

W. B. MCCOOL. Secretary to the Commission.

[F.R. Doc. 64-10683; Filed, Oct. 20, 1964; 8:45 a.m.]

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\*Correction ILJIS should read 1134S (29FR 14661)



DOCKET NUMBER FEDERAL RADIATION COUNCIL PETITION RULE

WASHINGTON 25, D.C.

PR 20.106 September 27, 1963

Unrestricted

Radioactivity in Eppluents to

Mr. Robert Lowenstein, Director Division of Licensing and Regulation Atomic Energy Commission Bethesda, Maryland

Dear Mr. Lowenstein:

This is to acknowledge your letter of September 10, 1963, in which you transmitted copies of a notice of proposed rule making to amend 10 CFR 20.

The proposed amendment appears to incorporate the recommendations of the Federal Radiation Council in its September 13, 1961, Memorandum for the President.

We very much appreciate receiving the copies. Both Claire and I would be interested in receiving a summary of any comments or suggestions you may receive as a result of publication of the amendment in the Federal Register.

Sincerely yours,

ompking

Paul C. Tompkins **Executive Director** 





### THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE

WASHINGTON

FEB 13 1954

PR-20,106

DOCKET NUMBER

Dear Mr. Chairman:

This Department has reviewed the proposed revisions of the Commission Regulation "Standards for Protection Against Radiation", 10CFR20, as published in the Federal Register on September 17, 1963.

We note that the amendments have been designed to bring the Commission's radiation protection standards into accord with the guides of the Federal Radiation Council. With the following comments, we have no objection to the proposed revision.

We understand that in the application of the proposed revision of 10CFR20, the Commission will be governed by the philosophy of the FRC stated as follows:

"There can be no single permissible or acceptable level of exposure without regard to the reason for permitting the exposure. It should be general practice to reduce exposure to radiation, and positive effort should be carried out to fulfill the sense of these recommendations. It is basic that exposure to radiation should result from a real determination of its necessity."

This philosophy is in accord with the Administration's policy of keeping our waters and air as clean as possible. We will continue to apply this policy in our water and air pollution control activities.

We concur completely in the lowering of the I-131 and Sr-89 standards to conform to the FRC recommendations. We do not understand why you are proposing to raise the Sr-90 and Ra-226 levels when it has been possible for existing installations to operate for some years under the more stringent standards. Thus on the basis of the information now available to us we cannot concur in the proposal for Sr-90 and Ra-226.

DR-530-

DOCKETEL

OFFICE OF THE SECRETARY

BRANCH

Application of the proposed revision of 10CFR20 could result in some cases in levels of radioactivity in the receiving waters which exceed State or local water pollution control standards. There could conceivably be specific instances in which the proposed maximum levels would exceed those found appropriate in an enforcement action under the Federal Water Pollution Control Act. Our technical people will of course work closely with your staff if such instances should arise.

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Sincerely, See

Honorable Glenn T. Seaborg Chairman, Atomic Energy Commission Washington 15, D. C.



GOCKET NUMBER PERMION RULE PR-20,106 Radioasticity in Effluents

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COMMONWEALTH OF KENTUCKY DEPARTMENT OF HEALTH 275 EAST MAIN STREET FRANKFORT, KENTUCKY

January 31, 1964



Secretary U. S. Atomic Energy Commission Washington 25, D. C.

Gentlemen:

#### Subject: Proposed Amendment to 10 CFR Part 20

We would like to resubmit comments on the proposed subject amendment on "Radioactivity in Effluents to Unrestricted Areas" as published in the Federal Register September 17, 1963:

The proposed changes in Appendix B, Table II, Column I and Column II are numerically accurate in interpreting Federal Radiation Council (FRC) radiation protection guides for individuals in the general population and using the listed assumptions.

The proposed changes based on FRC publications are appropriate at this time. However, consideration should be given to the intent of the radiation protection guides to provide maximum daily intake from all sources averaged over a period of one year. The FRC indicates that these guides should not be exceeded without careful consideration of the reasons for doing so and every practicable effort should be made to keep radiation doses below the guide levels. Our main concern is that exposures to individuals by air contamination and water contamination result in additional exposures through contamination of the food chain in which certain radioisotopes are reconcentrated in the chain. For example, it has been shown that the thyroid exposure is two orders of magnitude greater from drinking milk from cows that were foraged on vegetation contaminated by airborne radioiodine than that due to inhalation of the airborne contaminant.

It appears that there are many variables influencing stack effluents and stream effluents which ultimately result in radiation exposure to humans. We would appreciate the opportunity to participate in reviewing presently available data and in developing data to provide guidance on radiocontaminant disposal in air and streams. Secretary, U. S. AEC Page Two January 31, 1964

> These indicated variables will greatly influence the Commission's intent to impose limits on the gross quantity of radioactive materials released in air or water and in a specified period of time. We are concerned as to when these particular limits will be applied and how the limits will be developed.

In essence, we are in agreement with the philosophy expressed in the subject documents except that due consideration should be given to potential exposure from all sources and modes of ionizing radiation exposures from radiocontaminants discharged into the environment. This approach is very clearly stated in reports of the Federal Radiation Council.

Very truly yours,

Floyd W. Wilcox J Director of Radiological Health

FWW:gpl

CC: Ben L. Harless, Chief State Agreements Branch RAD

### COMMO WEALTH OF KENTUCKY DEPARTMENT OF HEALTH 275 EAST MAIN STREET

FRANKFORT, KENTUCKY

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Secretary U. S. Atomic Energy Commission Washington 25, D. C.





Westinghouse Electric Corporation

3 Gateway Center Box 2278, Pittsburgh 30, Pa.

November 15, 1963

\* Secretary U. S. Atomic Energy Commission Washington 25, D. C.

Dear Sir:

Subject: Proposed Amendment to 10 CFR 20 -Fed. Reg. Vol, 28, No. 181, p. 10170

The proposed amendment of 10 CFR Part 20, as published in the Federal Register, September 17, 1963, pages 10170 to 10172, has been reviewed and several suggestions are being made. In general, it appears that the proposed amendments could be worded in such a manner that it would be easier to interpret and understand them. Simplification of the wording and use of performance criteria wherever possible would be desirable.

It is suggested that the wording of paragraphs (a), (b), and (c) could be simplified and combined into two paragraphs somewhat as follows:

20.106 Radioactivity in effluents to unrestricted areas.

- (a) Except as authorized pursuant to § 20.302, or paragraph (b) of this section, the concentration of radioactive materials in any effluent crossing the boundary of a restricted area, when averaged over a period of one year or less, shall not exceed the limits specified in Appendix B, Table II, when the effluent contains licensed material other than that licensed under § 30.21 (General Licenses).
- (b) An application for a license, or for amendment of an existing license, may describe proposed releases greater than those permitted by paragraph (a) of this section. These will be approved if the applicant demonstrates that:

- reasonable steps have been taken to minimize the amount of licensed material in the effluent; and
- (2) individuals in unrestricted areas would not likely be exposed to concentrations of licensed and associated radioactive materials released from the restricted area exceeding the boundary concentrations specified in (a).

In addition to some simplification of the wording, it should be noted that (a) indicates where the limits are to be applied and also excludes materials covered by a General License. It would seem desirable to clearly indicate that persons having material under a General License, which requires compliance with 10 CFR 20, need not concern themselves with this provision since the quantities which they have are extremely small and the General Licenses are issued on the basis that these materials would not create any significant hazard.

The following suggestions are made for paragraph (d):

An application which proposes releases pursuant to paragraph (b) of this section should present sufficient information to substantiate that the proposed operating conditions will fulfill the requirements of paragraph (b). For release in water, information such as listed in (1) below should be included, and for release into air, information such as listed in (2) below should be included.

(Note: These lists would be prepared from the items included in the proposed amendment.)

These two separate lists are suggested to permit easier interpretation of what is wanted and to permit preparation of the application by making reference to each specific item. These lists should request pertinent information which is really necessary for a proper evaluation.

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If the previous suggestions are adopted, paragraph (e) could be reworded as follows:

Where the radioactive material is discharged through a conduit, such as a stack, tube, or pipe, limits may be established at the point where the material leaves the conduit. Where such conduit discharges within the restricted area, appropriate assumptions relative to environmental dilution and dispersion may be used to relate these limits to those specified in (a) or (b).

While the intent of paragraph (e) is good, its implementation would be extremely difficult. For example, who would determine that the daily intake of an exposed population was likely to exceed these values; how could it be determined whether the imposition of the proposed limits on the licensee would result in any significant lowering of the population exposure; and who would define the exposed population group? This paragraph should not be adopted in its present form. Perhaps some of the difficulties and uncertainties could be minimized by including the requirement that such a restriction on a licensee would be imposed only where it can be shown that the effluent was contributing more than 30% of the intake in the exposed population group.

It is recommended that the proposed concentrations specified in Appendix B be checked with the Chairman of NCRP, Subcommittee 2, (Dr. K. Z. Morgan) so that any minor differences between your proposed values and those which might be published by NCRP in the near future could be eliminated. The proposed values would, of course, be compared with 1/10th of the NCRP values for a 168-hour week. This suggestion is made in the interest of standardization which would minimize confusion when these limits are used by different groups of persons.

The reference in 20.305 should be changed to show the correct paragraph of 20.106.

Very truly yours,

- Cosarnes E. C. Barnes, Director Radiation Protection



Westinghouse Electric Corporation 3 Gateway Center, Box 2278 Pittsburgh 30, Pa.

E. C. Barnes





## Secretary

U. S. Atomic Energy Commission

Washington 25, D. C.



DOCKET NUMBER PR- 20.106

### COMMONWEALTH OF KENTUCKY DEPARTMENT OF HEALTH 275 EAST MAIN STREET

FRANKFORT, KENTUCKY

November 1, 1963

Secretary U. S. Atomic Energy Commission Washington 25, D. C.



Gentlemen:

Subject: Proposed Amendment 10 CFR Part 20

The following comments are submitted regarding the subject proposed amendment as published in the Federal Register on September 17, 1963:

It is impossible to use the Federal Radiation Council (FRC) Guides for total intake of various radioisotopes without summarizing all the methods of intake and applying all the parameters involved between effluent and human intake.

Your proposed "Concentrations in Air Limits" are apparently based only on intake by breathing due to air contamination. This assumption disregards the potential intake from contaminant deposition in the human food chain.

Your proposed "Concentrations in Water Limits" disregard the potential concentrations of various isotopes in material in the human food chain.

Unless you can directly adopt the FRC Guides as intended for total intake, it appears unnecessary to change concentration limits in effluents to unrestricted areas. For the potential exposure circumstances that you are assuming, maximum permissible levels in air and water can remain as listed in National Bureau of Standards Handbook 69.

The requirements are appropriate for applicant demonstration where he proposes to have effluents in concentrations higher than the specified limits in 10 CFR 20, Appendix B, Table II. In the applicant's demonstration that it is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to specified limits, the FRC Guides for total intake could very well be used for the specific isotopes that are covered. Secretary, U. S. AEC Page Two November 1, 1963

We are in favor of allowing appropriate assumption for environmental dilution and dispersion of effluents discharged within the restricted area.

It is particularly dangerous to apply limits for Iodine<sup>131</sup> as air-borne contamination based on exposure due to breathing only. It can be shown that the thyroid exposure is one hundred times greater from drinking milk from cows that were foraged on vegetation contaminated by air-borne radioiodine than that due to inhalation.

We would be very much interested in reviewing the criteria that will be used to specify limits on the gross quantity of radioactive material released in air or water in a specified period of time.

Generally, we agree with the philosophy of endeavoring to follow FRC Guides, keeping in mind that they are guides and not limits. There is always danger in attempting to amend all "magic numbers" in accordance with the latest thinking of a particular committee. We understand that published Guides for intake of isotopes covered at present may be amended during a meeting this month to clarify application to "normal peacetime operation."

Very truly yours,

Director of Radiological Health

FWW:gpl

Radioactivity in antrineut:

ODCKET NUMBER

PETITION RULE



TO:

HEADQUARTERS UNITED STATES ARMY MATERIEL COMMAND WASHINGTON XX, D.C. 20315

31 October 1963

SUBJECT: Proposed Regulation for Release of Radioactive Effluents

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

1. Reference Federal Register dated 17 September 1963, pages 10170 through 10172.

2. This headquarters has distributed copies of your notice of intention to amend the regulations concerning radioactivity in effluents released into unrestricted areas. The referenced Federal Register indicates that written comments or suggestions in connection with the proposed amendment should be sent to your office prior to 17 November 1963. Certain of our field elements have requested an extension in the time permitted for consideration of the proposed amendment.

3. In order to enable the Army Materiel Command to thoroughly review your proposed amendment, it is requested that the cut-off date for consideration of comments be extended until 1 December 1963.

FOR THE COMMANDER:

FRED M. BISHOFF

Chief, Safety Division Administrative Office

