

CORRECTIONS AND AMENDMENTS TO ICRP PUBLICATION No. 26

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In January 1977 the International Commission on Radiological Protection (ICRP) approved the final wording of the text of new recommendations in the realm of radiation protection (Publication No. 26), which expounds the principal concepts of the ICRP on this subject and presents recommendations concerning the choice of optimal conditions for ensuring the radiation safety of professional workers and the population, and the organization and implementation of radiation monitoring. The recommendations were published in Russian in the USSR in 1978 (Radiation Protection, ICRP Publication No. 26. Translated from the English. Edited by A. A. Moiseev and P. V. Ramzaeva. Atomizdat, Moscow (1978), 88 pp.). At a meeting in Stockholm, Sweden, in May 1978 the ICRP reexamined the recommendations presented in that publication and made the following statement.

Assessment of Radiation Risk. The risk factors which the Commission presented in Publication No. 26 (Sections 36-60) are based on the data of the ICRP Committee 1 on Radiation Effects. They are in agreement with the data given in the scientific literature and with information given in the 1977 report of the U. N. Scientific Committee on Atomic Radiation.*

On the basis of a continuous, careful analysis of available epidemiological and radiobiological data on the risk of the effects of ionizing radiation on man, the Commission believes that the data published up to May 1978 on these subjects do not provide a basis for a review of the numerical values of the risk factors. These values are very realistic estimates of the effects of radiation at low annual equivalent doses (within the limits of the permissible equivalent dose recommended by the ICRP).

To estimate the probability of stochastic effects from the action of ionizing radiation, the Commission (Sec. 105, Publication No. 26) recommends that weighting factors be used to sum up the equivalent dose in different organs and tissues. The Commission noted that it did not propose to include the wrists and forearms, feet and ankles, the skin, and the crystalline lens of the eye among the so-called "other organs." Therefore, $\sum W_T H_T$ should not be taken into account in the calculations. To preclude nonstochastic effects the Commission recommends that the appropriate maximum doses indicated in Sec. 103 be extended to these tissues.

In assessing the damage due to the irradiation of various groups in the population, one must take account of the low probability of deaths as the result of skin cancer caused by irradiation, e.g., in the case of the overall irradiation of the skin with low-energy β radiation. In this case a risk factor value of 10^{-4} should be used for a dose of 100 rem. averaged over the total skin surface of the body. This value will correspond to the coefficient $W_T \sim 0.01$.

The maximum dose for occupational exposure, as established by the Commission for all persons working with sources of ionizing radiation, are based on the average values of the risk factor for men and women. The variations of the risk level to persons of both sexes and of various ages under irradiation, mentioned in Sec. 38 of Publication No. 26, are discussed in greater detail in Publication No. 27 "Problems Arising in the Elaboration of an Injury Index." This publication also considered the principal data which formed the basis for the selection, for Publication No. 26 (Sec. 60), of a mean value of the genetically significant fraction (0.4) for occupational exposure and the mean value of the risk factor for death from cancer (10^{-4} rem^{-1}) for persons of both sexes and various ages.

Effective Equivalent Dose. The Commission recommends that the sum $\sum W_T H_T$ (see Sec. 104, Publication No. 26) be called the effective equivalent dose (denoted by H_E).

* This refers to the report of the U. N. General Assembly's Scientific Committee on the Effects of Atomic Radiation with the appendices "Sources and Effects of Ionizing Radiation." United Nations Organization, New York (1978). The report was published in English, Russian, French, and Spanish.

Some Changes in the Wording of the Text of Publication No. 26. The Commission believes that the following changes in the wording of Publication No. 26 will permit the sense of the recommendations to be expressed more clearly.

Section 38. The fourth and fifth sentences should read:

"Therefore, for the purposes of protection one and the same value of the maximum effective equivalent dose can be used with sufficient accuracy for all workers, regardless of age and sex. This value is based on the mean values of the risk level, given below for various organs or tissues."

Section 79. The first sentence should read:

"The maximum values of the equivalent dose established by the Commission for workers are intended for estimating the sum of the equivalent dose due to external radiation accumulated over a one-year period and the expected dose due to the entry of radionuclides into the human body in the course of that year."

Section 79. The following should be added at the end of this section:

"Similar principles underlie the use of maximum equivalent doses established for individuals from the population."

Section 89. In the third sentence delete "... intended for the use of the management in planning, and, therefore..." Further as in the text.

Section 93. In the first sentence delete "...intended for the purpose of planning and ..."

Section 107. The end of the last sentence should read:

"...notably, the maximum depth and surface dose indices $H_{I,d}$ and $H_{I,s}$ (see Sec. 108) and PGP (see Sec. 109).

Section 108. The last part of the first sentence should read:

". . . it is possible to estimate the maximum value of the equivalent dose which will be produced at a depth of 1 cm or more in a sphere of diameter 30 cm (depth dose index $H_{I,d}$)." Further as in text.

Section 108. The following should be added at the end of the paragraph:

"Moreover, the equivalent surface dose index (the maximum value of the equivalent dose in a layer at a depth of 0.07 to 10 mm in a sphere of diameter 30 cm) should not exceed 500 mZv to ensure the protection of skin covers. The annual equivalent radiation dose for the crystalline lenses of eyes with such limits for the indices of the equivalent depth and surface doses should in practice not exceed 300 mZv."

Section 110. This section should have the following wording:

"With a combination of external and internal irradiation the dose limits recommended by the Commission will not be exceeded if the following two conditions are satisfied simultaneously:

$$H_{I,d}/H_{E,L} + \sum_j (I_j/I_{j,L}) \leq 1 \text{ and } H_{I,s}/H_{sk,L} \leq 1,$$

where $H_{I,d}$ and $H_{I,s}$ are the annual indices of equivalent depth and surface doses, respectively, $H_{E,L}$ is the annual limit of the effective equivalent (50 mZv), $H_{sk,L}$ is the annual limit of the equivalent dose for skin (500 mZv), I_j is the annual intake of radionuclide j, and $I_{j,L}$ is the annual limit of the intake of radionuclide j.

Section 113. The second sentence should be worded as follows:

"In such cases external irradiation and the intake of radioactive substances into the human body may be permitted provided that the sum of the equivalent dose from the external irradiation and the expected equivalent dose due to the intake of radionuclides into the body does not exceed the corresponding doubled annual limit for any single event and not more than five times for the entire lifetime."

Section 187. In the first statement the term "limits of equivalent dose" should be replaced by the term "system of dose limitation."

Section 238. In the last sentence the third line should read:

"...articles of mass consumption, they were studied or monitored..." Further as in text.