SEASONAL VARIATION OF RADON GAS CONCENTRATIONS IN KINDERGARDENS OF SERPUKHOV MOSCOW REGION

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The problem of radiation exposure of population from radon gas in indoor air is well-known now and the national regulations on this factor are adopted in many countries [1]. But from our point of view existing regulations don't take into account the special group of population - childrens and tine adgers whose organizms are significally more sensitive to this factor. In this report we present some preliminary data on radiation exposure of childrens in schools and kindergardens from natural radon gas in t.Serpukhov(Moscow region) during 1993-1994 y.y.. Presenting this report we hope to attract attention of IRPA-96 Congress scientists to discuss the question about the necessity of new regulation on radon gas factor for childrens and tineadgers. The 5-th International Symposium in Salzburg, 1991, Natural Radiation Environment, tooke more attention for radon gas concentration in dweling, but only one publication concerned the above mentioned problem [2]. Me have measured the concentration of radon gas and it's DDP (daughter disintegrated products) in 36 kindergardens and schools in July 1993 practically simultaneously with the goal to choose objects for the following investigations. The results of DDP concentration (Crd) measurements are shown in Table 1.

Table 1. The number of rooms due to Crd, %.

Crd, Bq/cub.m	**0...40**	**40...100**	**100...150**	**150...200**
Number,%	**67**	**28**	**4**	**1**

For the more detail observation we choose three buildings with different radon gas concentrations. The procedure of measurement consists of determination of momentary radon gas concentration, momentary DDP concentration Crd and two - days integrated radon gas concentrations one time per month during one calendar year. The obtained data are given in Table 2.

Table 2. Momentary daughter concentration Crd, Bq/cub.m.

(The upper line represents month of measurements)

Dat	De	Fe	Fe	Ap	Apr	May	Jun	Jl	Au	Au	Oc	Nov
Crd	25	19	40	98	112	125	123	53	58	34	37	102

The mean Crd values per year are: for building 1 - 65 Bq/cub.m, for building 2 - 31 Bq/cub.m, for building 3 (background) - 11 Bk/cub.m. The mean equlibrium coefficient per year between radon and it's DDP for all investigated buildings was equal 0.6. But for the definition of the effective total dose it's more important to know the Crd daily variations. These data are shown in Tabl.3 for building 1.

Table 2. The daily variation of momentary DDP concentration Crd,

Bq/cub.m.(The upper line represents the hours of measurements)

H	11	12	13	14	15	16	17	18	19	20	21	22
Crd	92	73	62	79	78	65	58	38	40	43	38	56
H	23	24	1	2	3	4	5	6	7	8	9	10
Crd	53	88	77	53	35	39	52	50	50	67	124	131

Now there is the possibility to take into account the real children exposure during the maximum daily time from 8 a.m to 6 p.m.(Tabl.4).

Tabl.4. Exposure of children in daily time (1840 hours), mSv/y

Buildings	Dose from DDP	External gamma dose	Summary dose
N 1	1.35	0.26	1.61
N 2	0.65	0.24	0.89
N 3	0.32	0.22	0.54

These data must be compaired to "normal" effective population dose per year (8500 hours) from radon gas 1.26 mSv/y [3].

Summary:

- the using of only integral methods for the determination of mean value C per year is not enough. It's nesessary to have the additional data on the daily varyations of it to correct the estimation of effective dose.

- from our point of view it is nesessary to have the special regulation on children exposure from the radon factor.

REFERENCES

1. ICRP publication No 39, 1986

2. Radiation Protection Dosimetry vol. 45, No 1/4, pp. 499-501.

3. E.M.Krisyuk. Radiocionnyj fon pometschenij. Moscow,"Energoatomizdat", 1989.