

Report of the head of the Chernobyl NPP laboratory on the radiation situation at the station

May 23, 1986

Secret

Information on the radiation status of the environment at the Chernobyl Nuclear Power Plant as of May 23, 1986

It's better now. And the pond water level is 370 Bq/L.

Between April 26, 1986, and May 23, 1986, the radioactivity in environmental objects decreased by more than half due to the decay of short-lived radionuclides. During this period, Np-238 and Te-232 decayed almost completely, iodine-131 decayed eightfold, and lanthanum-140 decayed fourfold. Therefore, the radionuclides with half-lives of 35–65 days are currently the dominant radionuclides: ruthenium-103, zirconium-95, niobium-95, and cesium-137, with a half-life of 30 years, is beginning to contribute.

By now, the bulk of the radionuclides has fallen to the ground, and, therefore, the dose rate is determined by the underlying surface. The activity of soil, grass, and vegetation has increased everywhere, while the dose rate in the atmosphere has decreased by approximately half.

The gamma dose rate at a height of 1 meter from the ground in the direction of the first “flare” (in the northwest direction) is: Yanov – 410 $\mu\text{Sv/hr}$, Buryakovka – 470 $\mu\text{Sv/hr}$, Tolsty Les – 500 $\mu\text{Sv/hr}$, in the area of the gardens of the radio plant – 5,400 $\mu\text{Sv/hr}$.

In the northern direction, where the second release was observed on April 27, 1986, the dose rate ranges from 40 to 800 $\mu\text{Sv/hr}$.

In the direction of Kiev, it ranges from 10 to 300 $\mu\text{Sv/hr}$.

In the city of Pripyat, the dose rate remains high in places, varying from 360 to 7,200 $\mu\text{Sv/hr}$. The concentration of radioactive aerosols in the air remains high, apparently indicating a constant supply of aerosols from the unit and partial activity transfer in the environment (Table 1).

Radionuclide Content in Atmospheric Air

Table 1

Measurement location	Concentration of radionuclides (Bq/m ³)						
	Ce-141	I-131	Ru-103	Cs-137	Zr-95	Nb-95	La-140
Chernobyl	5.92	6.66	15.91	0.37	2.59	8.14	2.96
Tolsty Les	0.30	0.56	0.74	0.41	0.41	0.59	0.20
Zorin	0.41	0.96	1.92	0.08	0.30	0.74	0.21
Pripyat	33.67	44.40	44.40	12.95	40.70	74.00	7.40

The level of soil contamination is uneven and varies widely across the territory, ranging from 1,480,000,000,000 Bq (1.48 TBq) to 118,400,000,000,000 Bq (118.4 TBq) per square kilometre, which is 4-6 orders of magnitude higher than the pre-accident period.

Contamination of pine forests in the northwest sanitary protection zone was particularly significant. The dose to the pines over 20 days was more than 500,000 mSv (500 Sv), exceeding the lethal dose for pines of 300 Sv. These pines will likely die.

The data presented in Table 2 *[absent from the document]* show that the accident had a minor impact on the cooling pond. However, subsequent actions, such as pumping water from Unit 4 into the pond and draining drain water from the liquid waste containment tanks, significantly worsened the radiation situation. Recently, activity in the drainage channel has increased significantly, leading to contamination of the Pripjat River.

The radionuclide content in the Pripjat River remains high (Table 3) *[this table is also absent from the document]*

The water from artesian wells is clean.

The radiation situation at the Skazochny pioneer camp has remained virtually unchanged since May 2, 1986.

The dose rate at a height of 1 meter is 28.8–54.0 $\mu\text{Sv/hr}$.

The dose rate on grass ranges from 36 to 216 $\mu\text{Sv/hr}$, and the dose in open areas over 10 days is 20 mSv.

To reduce the dose rate in the pioneer camp, the best option is to remove a 1–2 cm layer of soil and grass and bury it in a trench. After removal, cover these areas with plastic film.

An analysis of agricultural produce from settlements in the Ivankov district showed that vegetable roots are practically clean and can be eaten. Onions should be washed before eating; sorrel absorbs significant activity on its leaves, which cannot be washed off. Egg shells are dirty, but the whites and yolks are clean. Fish collected from the Pripjat River at the Ivankov fish farm contain 74 Bq/kg of I-131 and 74 Bq/kg of Cs-137, which amounts to a dose of 0.05 mSv/h for 24 kg of edible fish.

[There is something wrong here – the dose for someone eating fish cannot possibly be expressed in milliSievert per hour. If we use the currently applicable dose coefficients for ingestion, the dose from consumption of 24 kg of fish would be in order of 0.06 mSv.

The conclusion: the dose of 0.05 mSv is generally correct and the “hour” is a typographical error]

Head of the Laboratory of the Ministry of Internal Affairs
VI. Korobeynikov