1. INTRODUCTION

The accident at the Chernobyl NPP is the largest technogenic accident of our epoch, the global consequences of which for whole mankind with the course of time will larger and larger significance.

In spite of the fact, that the radioactive contamination owing to the Chernobyl accident affected the whole world, just Belarus was subjected to the most intensive radioactive contamination. In addition the radioactive contamination territory of Belarus more than 37 kBq/sq.m. by caesium-137 has made 23 % from the whole of the Republic. At the same time as a result of the Chernobyl accident, 5,0 % of a territory of the Ukraine and 0,6 % of Russia have been contaminated with radionuclides (fig.1).

Fig. 1 Areas in Belarus, the Ukraine and Russia with the density of caesium-137 pollution over 37 kBq/m² (the ratio to the total area of the countries territory).
By virtue of a primary direction of movement of air masses, contamination with radionuclides in the northern-western, northern and northern-eastern directions in the initial period after the accident, the significant increase of the exposition doze rate was registered practically on the whole territory of Belarus. In particular, the levels of a radioactive contamination by short-lived iodine-131 in many regions of the Republic were so great, that the resulting irradiation of millions of people is qualified by the experts as a period of "iodine impact" (fig. 2).

In April - May 1986, the highest levels of iodine-131 fall-out took place in the nearest 10-30 km zone in the Bragin, Khoiniki, Narovlya. Areas of the Gomel region, where the content of iodine-131 in the soils has amounted to 37000 kBq/sq.m. and more, and the exposition doze rate of the gamma-radiation has amounted to 25-100 mR/h.

In Chechersk, Kormyany, Buda-Koshelev, Dobrush Areas the levels of contamination reached 18500 kBq /sq.m.

The south-western regions, that is Elsk, Lelchitsy, Zhitkovichi, Petricovichi Areas of the Gomel Region and the Pinsk, Luninets, Stolin Areas of the Brest Region have been significantly contaminated.

The high levels contamination took place also on the north of the Gomel and the Mogilev Areas. For example, in a number of places the Vetka Area of the Gomel Region the content of iodine-131 in the soil was more than 20000 kBq/sq.m. In the Mogilev Region the highest contamination by iodine-131 has been found out in the populated areas of the Cherikov and Krasnoołyje areas, where the level has amounted to 5550 - 11100 kBq / sq.m.

The high levels of contaminations the territory by iodine-131 have formed large dozes of irradiation, first of all, thyroid gland, has resulted in future in a significant increase of its pathology. As in January 1995, the number of the thyroid cancer cases for adolescents has accounted for 379 cases. For comparison only 4 cases have been registered in January, 1986.

It evidences, that in comparison with Russia and Ukraine, the Republic of Belarus had appeared to be in more complex and heavy conditions on elimination of the consequences of the accident.
Important problem in the period following the accident was evaluation of radioactive contamination of the territory Belarus and creation of specially oriented monitoring (fig.3).

In Belarus 46,45 thousands of square kilometers of the territory have been subjected to contamination with Cs-137, with its content in the soil equal to more than 37 kBq/sq.m. 27 cities and more than 3600 populated areas with the population 2,2 millions, that is more than 1/5 of the population of Belarus are located on this territory.

**Committee for Hydrometeorology**

**Republican Centre of Radiation and Environment Monitoring**

**the Ministry of Agriculture**

- Soil

**Committee for Hydrometeorology**

- Soil
- Water
- Air

**the Ministry of Forestry**

- Soil

**the Ministry of Housing and Communal Services**

- Objects of Housing and communal and water-supply and sewerage system services

**the Polessian State Radio-ecological Reservation**

- Soil

**the Institute of Radiobiology**

- Soil

**the Belarus of water problems**

- Surface water (small rivers)

**the Belarusgeology**

- Radioactive contamination of underground water

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**Fig. 3.**

**The Radiation Monitoring System**

**on the territory of Belarus**
2. METHODS

Each three year, accoding to the results of complex examination the maps of the content of caesium-137, strontium-90 and plutonium isotopes in the soil are issued. Taking into account the non-uniformity of the radioactive contamination and necessity of realization of protective measures on reduction of dose loads and increase of safe residence of the population on contaminated territories, the examination of 350 thousands of personal plots of land with issuing to the their owners the radiation passports.

As a result of accident at the ChNPP, the Gomel, Mogilev and Brest Regions have appeared to be the most contaminated.

There are cases, when within the same populated area, clean sites neighbor the highly contaminated places. The populated area Kolyban of the Bragin Area of the Gomel Region can be taken as an example, where the value of contamination with caesium-137 is in the range from 170 to 2400 kBq/sq.m. The maximum levels caesium-137 in the soil of the populated areas of the nearest zone have been found in the Bragin Areas - 2600 kBq/sq.m. and in the distant zone - at the distance 250 km, for instance, in the populated area Chudyany of the Cherico Area of the Mogilev Region. They accounted for 51000 kBq/sq.m. (fig.4).

Fig.4 Radioactivity contamination of Cs-137 in soil of the territory of Belarus (01.01.1995)

In the Brest Region the south-east part has been subjected to contamination where in 6 regions the content of caesium-137 in the soil amount to 37 - 185 kBq/sq.m., and the maximum levels reach 400 kBq/sq.m. In the Minsk, Grodno and 4 populated areas of the Vitebsk Region the content of caesium-137 in the soil amounts to 37 kBq/sq.m. On the other territory of Belarus levels of contamination of the soil with caesium-137 are higher in comparison with the values before the accident and only the northern-western regions of the Vitebsk Region. They are comparable to global fall-outs. [1]
The contamination of the territory of the Republic with Sr-90 has more local character. The levels of contamination of the soil with Sr-90 more than 6.5 kBq/sq.m are found on the area 21.1 ths. sq.km., amounting 10% of the total area of the Republic. The maximum levels Sr-90 in the soil in the populated areas of the nearest zone are found out within the 30-km zones of the ChNPP and 1800 kBq/sq.m. in the Khojnik area of the Gomel Region. The highest content of Sr-90 in the soil of a distant zone is found out at distance of 250 km - in Cherikov area of the Mogilev Region and 29 kBq/sq.m. including the northern part of the Gomel Region Vetka area - 137 kBq/sq.m. (fig. 5).

Levels Sr-90 (kBq/m²)

-5.55-18.5
-18.5-111
-111 and more

Fig. 5 Radioactivity contamination of Sr-90 in soil on the territory Gomel and Mogilev regions of Belarus (01.01.1995)
The contamination of soil by the plutonium isotopes more than 0.37 kBq/sq.m. covers the area nearly 4.0 ths sq.km., amounting to nearly 2% of the area of the Republic. These territories are predominantly in the Gomel Region and the Chechersk Area of the Mogilev Region.

Contamination of the soil by plutonium isotopes 0.37 up to 3.7 kBq/sq.m. is the highest in the Bragin, Narovlya, Khoiniki, Rechitsy and Dobrush, Loev Area of the Gomel Region. The contents of plutonium in the soil 3.7 kBq/sq.m is characteristic for 30-km zones of ChNPP. The highest levels of plutonium isotopes in the soil are observed in the Massany populated area of Khoiniki rea more than 111 kBq/sq.m (fig. 6).

Radioactivity contamination of Pu-238,239,240 in soil on the territory of Gomel and Mogilev regions of Belarus (01.01.1995)

In accordance with the article 4 of the Law “About the Legal Region of the Territories, Subjected to Radioactive contamination after the accident at ChNPP “ the territory of the Republic of Belarus is divided into zones depending on radioactive contamination of the soil by radionuclides and the value of the average annual effective doze equivalent.
3. RESULTS

At present the radiation situation of the territory of Belarus has stabilized however the results of monitoring show that in the soil and objects of environment the accumulation of americium-241 is observed and in course of time its concentrations will increase.

Forecast of distribution of caesium-137 on the territory of Belarus in 2016 y. shows that the contamination of more than 37 kBq/sq.m will be observed at the area more than 28,3 ths. km, that accounts 14% from the total territory of Belarus (fig. 7).

It connection with the above said it is necessary to emphasize the increased of role of the radiating control and monitoring of contaminated territories the result of which permit to observe changes to reveal additional sources of contamination, as well as to predict further development of radiation-ecological situation. This forecast should be the basis for formation of the policy of protective measures.

REFERENCE