METADATA ON THE RADIOACTIVE CONTAMINATION OF ENVIRONMENTAL OBJECTS ON THE TERRITORIES OF RUSSIA AND THE USSR

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A unique data archive, accumulated at the Taifun Scientific and Industrial Association in 1954–2005, on the radioactive contamination of the environment on the territory of the USSR and Russia is presented. The archive contains data on the yearly total $\beta$ activity of atmospheric fallout on the underlying surface, the total volume $\beta$ activity in the atmosphere at the ground, the results of measurements of the $^{90}$Sr and $^{137}$Cs content in samples combined over one month or quarter, atmospheric aerosols and fallout on individual points, the volume activity of tritium and $^{90}$Sr in water, rivers, lakes and seas, and the radionuclide contamination density of the territories of populated points as a result of the Chernobyl accident.

The first powerful nuclear explosions conducted in the atmosphere at test sites on this planet in 1952–1954 caused radioactive contamination of environmental objects – air, water, and soil. It became obvious by this time that there is a need to organize a branched system of observation points for observing the changing radiation conditions in order to assess the damaging consequences of the nuclear explosions. In the USSR, systematic daily observations of the atmospheric fallout of the radioactive products of nuclear explosions onto the underlying surface began in March 1954 at 120 meteorological stations. Up to 1954, the measurements of the volume activity of the radioactive products of nuclear explosions in the atmosphere and the fallout of these products were performed randomly and sporadically.

The Central Institute of Forecasting of the Hydrometeorological Service provided the synoptic support for the nuclear weapons tests on test areas in the USSR. In addition to forecasting the transport of radioactive clouds, formed as a result of nuclear explosions, in the atmosphere operational information on the results of daily observations of $\beta$ and $\gamma$ radiation on the meteorological sites was provided to the Central Institute of Forecasting. Since 1958, the work on studying the global radioactive contamination of environmental objects by the products of nuclear explosions was focused on the Obninsk test area of the Institute of Applied Geophysics of the USSR Academy of Sciences, which later became the Taifun Scientific and Industrial Association.

The number of points where observations were conducted on the radiation conditions, as part of the governmental service for radiation monitoring of the environment on the territory of the USSR, gradually increased and reached a peak at the end of the 1980s after the Chernobyl accident. The radiation monitoring service performed the following types of observations:

- measurement of the $\gamma$-ray exposure dose rate on location at 2467 observation points;
- measurement of the intensity of $\beta$ radiation on the underlying surface at 600 points;
- samples of radioactive aerosols were obtained from the atmospheric layer near the ground at 89 points (at three of these points the volume activity of $^{85}$Kr was determined over a period of several years);


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• samples of radioactive fallout (flux of radioactive aerosols from the atmosphere on the underlying surface) were obtained at 527 points;
• samples of precipitation, river and sea water were obtained at 47, 62, and 6 points, respectively, to determine the tritium content;
• samples of fresh and sea water were obtained at 140 and 37 points, respectively, to determine the $^{90}$Sr content.

As a rule, the soil samples were obtained at 55 meteorological stations during survey expeditions on the territory of the USSR or separate regions of the USSR and only during a period of 2 yr (1965–1966). Expedition surveys of the radioactive contamination of seas and separate regions of the world oceans and the troposphere were made using various airborne apparatus (probes, aircraft, helicopters) outfitted with dosimetric equipment.

At the present time, the governmental radiation monitoring service is measuring the $\gamma$-ray exposure dose rate at 1305 sites, samples of radioactive aerosols and fallout are being taken at 51 and 407 sites, respectively, samples of precipitation and river water are being taken at 30 and 15 sites, respectively, to determine the content of tritium, and samples of fresh and sea water are being taken at 43 and 8 sites, respectively, to determine the $^{90}$Sr content [1]. The radiometric, $\gamma$-spectrometric, and radiochemical analyses of samples of environmental objects are being conducted at 40 radiometric laboratories of the radiation monitoring service.

The Institute of Experimental Meteorology, which is part of the Taifun Association, has been providing since 1964 the scientific-methodological support of the work and the acquisition, processing, analysis, and generalization of the information, entering the radiation monitoring network, on the radiation conditions on the territorial and regional levels. Over the